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"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboullène*.

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ERRATA.

Page 18, line 13 from bottom, *for* "quick" *read* "quic."

„ 113 „ 24 „ top, *for* "Alt." *read* "Alluand."

„ 134, lines 6, 9, 10, 11 from bottom, *for* "farientris" *read* "flacicornis."

„ 135, line 3 from top, *for* "farientris" *read* "flacicornis."

„ 143 „ 5 „ bottom, *delete* "R.N."

„ 179 „ 18 „ top, *for* "biguttatus" *read* "guttatus."

„ 200 „ 7 „ top, *for* "Pomphilus" *read* "Pompilus."

„ 242 „ 14 „ bottom, *for* "angule" *read* "angulate!"

The Annual Subscription for 1919 is 9/-.

[See p. 2 of Wrapper.]

Third Series, No. 49.]
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THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

EDITED BY

G. C. CHAMPION, F.Z.S. J. E. COLLIN, F.E.S.

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J. J. WALKER, M.A., R.N., F.L.S.

VOLUME LV.

[THIRD SERIES—VOL. V.]

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THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

VOLUME LV.

[THIRD SERIES, VOL. V.]

NOTES ON VARIOUS SPECIES OF THE GENUS *CHALCHAS* BLANCH.

(COLEOPTERA.)

BY G. C. CHAMPION, F.Z.S.

The following notes have been made during a recent examination of the British Museum material of this remarkable South American genus of Malacodermata, about 100 examples in all. Eleven species belonging to it were enumerated by Fairmaire in his second monograph (Ann. Soc. Ent. Fr. 1849, pp. 1–22, pl. 7), and the males of eight of them extremely well figured, one other having been described by Erichson at about the same period. Since that time three species only seem to have been added—*C. sallei* and *abnormis* Fairm. (1878), and *C. fairmairei* Bourg. (1900). The extraordinary sexual characters were given at length by Fairmaire (*l. c.*), but in the same author's subsequent paper (1878) the ♂ and ♀ of *C. sallei* were wrongly identified, and the same remark applies to Erichson's description of *C. turgidus*. The species not represented in the Museum are *C. sexplagiatus* (♀ only known), Colombia, *turgidus*, Zuruma River, Guiana, and *fairmairei*, Orinoco. The only recorded observation as to their life-history is a statement by Sallé that one of the species has been found on potato-plants in Venezuela. Blanehard (1845) used the generic name *Chalchas* (*Culchas* being probably intended), Fairmaire and later writers emending it to *Chalcas*!

C. cyaneus Fairm.—Six males and four females, one of the former having the elytra obscure nigro-violaceous.—Colombia or Venezuela.

C. lineatocollis Fairm.—Three males and four females, varying in the development of the small black spots on the disc of the elytra.

The male has a feeble lateral carina, as in the same sex in *C. lateralis*. One specimen only bears a locality label, Colombia.

C. lateralis Fairm.—Two males and one female from Colombia, and one female labelled "Peru" (*ex coll. Fry*), this latter locality requiring confirmation. They agree in colour with Fairmaire's ♂ figure, except that the elytra have one or two oblique, more or less distinct, testaceous patches near the apex.

C. trabeatus Fairm.—Two males and six females, the former agreeing with Fairmaire's ♂ figure, one of the latter having the common black post-median fascia of the elytra reduced to one or two small spots on each wing-case (var. *bipunctatus*, Pie, L'Echange, 1903, p. 108).—Colombia and Venezuela.

C. bremei Fairm.—Five males and six females, including two pairs separately pinned. The elytral markings are very variable in both sexes, one ♀ having the testaceous patches reduced to a long lateral stripe and a small subapical spot (as in the insect named by Pie *C. fumatus*, var. *luteonotatus*). The males have the prothorax and base of the elytra thickly nigro-pilose, a character distinguishing *C. bremei* from the same sex of *C. humeralis*, *sallei*, and *fumatus*.—Colombia and Venezuela (Merida and Caracas).

C. unicolor Fairm.—One female from Colombia, acquired in 1846. The male is figured in Lacordaire's "Atlas" (pl. 45, fig. 5).

C. humeralis Fairm.—Four males and six females, the females varying slightly in the development of the dark markings. The broad dense tuft of long erect black hairs on the swollen portion of the disc of the elytra before the middle is a remarkable ♀ character in this species and in *C. sallei*.—Venezuela.

C. sallei Fairm.—Six females from Venezuela must belong to this species, as they have the elytra more constricted behind the middle than in *C. humeralis*, and are also differently coloured—nigro-eyaneous or black, with three large patches on the disc (the post-basal one transverse, the submedian transverse or subquadrate, and the subapical rounded), and a lateral stripe, testaceous. A series of eleven males from the same country almost certainly belong here: seven of them have the elytra maculate, much as in typical *C. bremei*, ♂ (from which they differ in having the elytra smoother and less metallic, and glabrous at the base, and the prothorax more sparsely pilose); the other examples, with the dark markings partly or almost entirely obsolete (except at the base), are scarcely separable from the same sex of *C. humeralis* and

C. fumatus. A pair of *C. sallaei* as here identified was presented to the Museum in 1897. The types were also from Venezuela.

C. fumatus Fairm.—Three males and three somewhat abraded females, all from Venezuela. A very close ally of *C. humeralis*, the ♀, according to Fairmaire, wanting the large tuft of long black hairs on the elytra, and the ♂ having the suture more strongly gibbous at the middle. The ♀ ♀ before me have the elytra cyaneous, with a common, broad, post-scutellar patch, a lateral stripe, and one or two subapical spots (connected along the suture with the scutellar patch in one example), testaceous. Two varieties of *C. fumatus*, from Colombia, have been named by Pic *luteonotatus* and *wheeleri* (L'Echange, 1913, p. 108), both apparently from ♀ ♀, though *wheeleri* is said to be ♂. The types, ♂ ♀, were found by Sallé on potato plants at Merida, Venezuela. Fairmaire suggests that these insects may be attached to wild Solanaceæ.

C. obesus Fairm.—Seven males and nine females, showing no variation, the ♂ having remarkably inflated opaque elytra.—Venezuela.

C. lugubris Fairm.—One male and three females, the latter having the elytra more dilated at the apex than stated in the description of that sex.—Colombia and Venezuela.

C. abnormis Fairm. (*correptus* Champ.).—The ♂ of this species was described by Fairmaire (Rev. et Mag. Zool. 1878, p. 268), the ♀ by Pic (L'Echange, 1913, p. 109), and both sexes by myself in a recently published paper on *Astyulus**, under which the insect was placed with some doubt, the ♂ having the elytra very little wider than the ♀. The elongate and narrow ♂ tegmen, as stated in the description of *A. correptus* (No. 28), is different from that of all the numerous species of *Astyulus* enumerated in the above-mentioned paper, and, in fact, is very like the corresponding organ of *C. sallaei*, in which it is dilated at the tip, and closely ciliate at the sides before the apex. In addition to the abraded pair recorded by myself, the Museum possesses another pair from Venezuela (*ex coll. Fry*) in much better condition, with the luteous pubescence of the upper surface intact, and the intermixed long, erect, darker hairs standing out very prominently on the prothorax and elytral humeri.

Horsell,

December 18th, 1918.

* Ann. & Mag. Nat. Hist. (9) ii, pp. 337-367 (Oct. 1918).

A NEW SPECIES OF OTIIRRHYNCHINE BEETLE OF THE
GENUS *RHYNCOGONUS* SHARP FROM LAYSAN ISLAND.

BY R. C. L. PERKINS, M.A., D.Sc., F.Z.S.

Though widely spread in the islands of the Pacific Ocean the species of this genus, so far as our present information goes, are most numerous represented in the Hawaiian group. The insect here described was captured some years ago by Mr. A. Bryan on Laysan Island, where he was chiefly engaged in a study of the Avifauna. Laysan is very distant from the main islands of the group, but its land fauna is essentially Hawaiian.

Rhyncogonus bryani, sp. n.

Piceo-niger, tibiis tarsorumque unguiculis magis rufescentibus, setis squamosis pallide flavescens vestitus. Oculi prominentes, fortiter convexi. Caput punctato-strigosum, rostro antice impresso. Antennarum articulus secundus et tertius subaequilongi. Pronotum densissime, nec profunde, rugoso-punctatum, linea brevi mediana laevi, setis squamiformibus appressis (latera versus densioribus) aliisque gracilioribus vestitum. Scutelli vestitu densissimo, punctum pallidum conspicuum formante. Elytra seriatim, haud profunde, punctata, setis appressis squamiformibus, aliisque gracilibus (brevibus tamen) et suberectis, plus minus lineatim dispositis, vestita, interstitiis tribus utrinque subcarinatim elevatis, pseudepipleuris fere aequaliter (haud maculatim) vestitis. Abdominis segmenta basalia distincte largeque punctata, punctis magnis, segmenta duo parva intermedia puncturatione obscura sculpta. Long. ♀ rostro inclusu fere 9 mm.

I have seen only a single female of this species and had hoped to include with it one or two others from the main islands, but in the case of the latter, owing to the variability of many of the described forms, the material was too small for any decision as to their specific value. The Laysan insect appears to me more distinct than are most of the Hawaiian representatives one from another. In the characters of the head and antennae it most resembles the littoral *R. vestitus* Sh. or *R. extraneus* Perk., which is attached to low plants of the open country. In form and in the sculpture of the pronotum *R. bryani* more nearly approaches some of the species found in mountain forests. The three carinae of the elytra, at least towards the base, are very conspicuous in lateral aspect, the outer one forming the division between the pseudepipleura and the rest of the dorsal surface.

The type, I believe, belongs to the Bishop Museum in Honolulu, and will be returned to that institution.

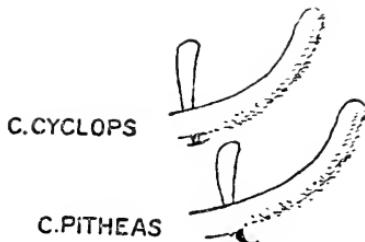
Paignton.

December 1918.

CATAGRAMMA PITHEAS AND CATAGRAMMA CYCLOPS
DISTINCT SPECIES.

BY W. J. KAYE, F.E.S.

For a long time it has been uncertain whether *C. cyclops* might not be an aberration or race of *C. pitheas*. So far as is known, it has only been taken a short distance up the Tapajos River, one of the larger tributaries of the Amazon, at a place called Itaituba. *C. cyclops* was originally described by Staudinger from this locality, in "Iris," iv, pp. 66-71 (1891). At first, five or six specimens were sent, then some twenty more, all of which were captured by D. O. Michael at this same place. Although the obvious difference on the underside, by the complete absence of the upper eye-spot, gives the insect a distinct appearance, it has been felt by many that *cyclops* might only be an aberration of the widely spread and somewhat variable *pitheas*. A dissection of the genitalia of two *cyclops* and two *pitheas* makes it quite clear that these two are distinct species. The harpe of both is of the same shape, but inside the harpe there is a curious small organ, which is



adze-shaped at its extremity in *cyclops* and sickle-shaped in *pitheas*. A reference to the two figures will show the difference at once.

Staudinger very carefully diagnosed *cyclops* and detected all the salient differences which are there. It usually has a blue gloss in the ♂ and always has a "somewhat more curved, rather narrower and somewhat shorter" following discal band "only running to the first median vein." He further says that amongst all the *pitheas* he finds only one from Venezuela with a band almost as short and narrow as in *cyclops*. In *cyclops* on the underside the black inner basal stripe is narrow and less evenly curved. The ground-colour is tawny yellow and the upper eye-spot as found in *pitheas* is totally absent. In all the *cyclops* sent Staudinger says none showed "the least trace of the second eye" and "not one in hundreds of *pitheas* shows a tendency for the eye to disappear."

Godman and Salvin, in the "Biologia Centrali-Americana," quote the Lower Amazon as a locality for *C. pitheas*, so it is possible both species might occur in the same district, but this wants confirmation.

C. pitheas breaks up geographically into three fairly distinct races:—

Catagramma pitheas centralis—Costa Rica to Panama.

Catagramma pitheas columbiana—Colombia.

Catagramma pitheas pitheas—Venezuela, ? Peru.

C. cyclops is known from only one locality:—

Catagramma cyclops—Lower Amazon, Tapajos, Itaituba.

The material for these notes was all found in the Hill Museum, Witley.

Surbiton.

December 1918.

EGG-LAYING OF *EMPHYTUS SEROTINUS*.

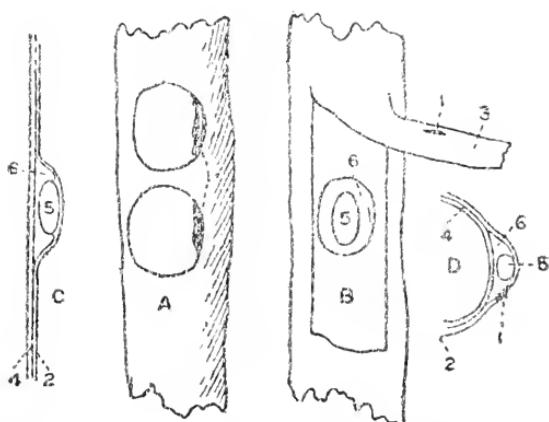
BY T. A. CHAPMAN, M.D., F.R.S.

It is common knowledge that this species lays its eggs in the late autumn, that it hibernates as an egg which hatches in the spring. I have been unable to find any record of this that goes much beyond the bare statement I have made, and no actual details.

As this is a very unusual habit amongst sawflies, I thought I should like to know something more about it. My observations leave much to be desired, but they enabled me to form some idea of this portion of the life-history of the insect.

Last spring I collected some of the larvae, which duly went down into the sand I provided them with. Whether this did not suit them or whether my care of them during the summer was defective, a very considerable proportion of them perished. Looked at in September, I found there were some of them still larvae; they were in cavities in the sand, without any sort of cocoon. Flies, however, emerged in October, and some were placed with oak twigs in a glass jar, others were sleeved on growing oak. The flies included several males, but I could not ascertain whether pairing was necessary before eggs could be laid. The sleeved insects, with whom no male was included, laid no eggs. The flies in the jar laid twenty or thirty eggs; these were laid on twigs of the year, those of the previous year were not touched, nor were those of the year that were less than 2·5 mm. in diameter.

The largest number of eggs apparently laid at one time was eleven; these are laid in a series on one side of the twig, beginning close to the end and extending downwards for about 27·0 mm. The twig is about 100 mm. long and 3 mm. wide at the base and 2·5 mm. at the thinnest portion. The position of each egg is marked by a rounded and almost circular elevation of the surface of the bark, actually from 1·8-2·0 mm. across and 2·0-2·3 mm. in the line of the twig; each is made separately, and may touch its next neighbour or be separated by an interval of as much as 0·8 mm. The incision of entry is quite visible as a darker line



Rough diagrams to show disposition of egg, enlarged about 6 times.

- A. Portion of twig with two eggs.
- B. An egg in position with film of bark raised.
- C. Longitudinal section through egg.
- D. Transverse section through egg.

- 1. Mark of incision. 2. Film of surface-bark (dead?). 3. Film of surface-bark over egg raised. 4. Layer of green living bark. 5. Egg. 6. Adventitious growth surrounding egg.

down one side, and appears to have the margins slightly separated; it is 1·0 mm. long, varying very little. One would expect the wound to remain a little open, since the presence of the egg raises the bark so that it cannot easily close up, and the bark is no longer actively alive and capable of healing over, in the way that usually occurs when a sawfly lays in growing leaves and stems, sometimes quite obliterating the line of entry. There appears, however, to be some consolidated exudation in the wound, closing it up, derived no doubt from the deeper, more living, tissues in which the egg is placed.

The incision of entry is sometimes on one side, sometimes on the other of the egg-pocket, as one looks at them with the twig held upright.

Probably the fly makes the pocket to the right or the left as she sits at work, but it is possible that she always works to one side, but sometimes with head towards the base, at others to the end of the twig.

The surface of the twig looks slaty grey, but on examining a pocket containing an egg is seen to consist of a very thin, delicate, superficial bark of a brownish colour, no doubt dead bark-tissue, and beneath this a bright green, no doubt living layer; the brown overlying the green produces the slaty tint. The egg-pocket is between these two layers, immediately on the green layer and beneath the brown one. When exposed by removing the delicate bark the egg is seen to be nearly 1 mm. long and about half a millimetre across, apparently nearly circular in transverse section, the long axis parallel with that of the twig, pale greenish in colour. It is supported and surrounded by a green mass of adventitious tissue, either consolidated exudation or tissue of the same nature as that of the galls, to the formation of which we know the oak so freely lends itself. It would be interesting to know whether this gall-like material forms the first meal of the larva, but my cut twigs will probably not live long enough for me to ascertain this. At first view this seems an unusual and, to me, quite a new feature in the egg-laying of a sawfly, but it is obvious that it is parallel to, if not absolutely identical with, the fluid exudation that occurs with the eggs of sawflies laid in growing leaves and other tissues, that is at once absorbed by the egg, which grows in some cases, before the embryo matures, to a good many times its original bulk.

Betula, Reigate.

November, 1918.

ADDITIONS TO E. SAUNDERS'S CATALOGUE OF BRITISH
HYMENOPTERA (ACULEATA), 1902, AND CHANGES IN NOMENCLATURE.

BY R. C. L. PERKINS, M.A., D.Sc., F.Z.S.

Since the publication of the "Catalogue of British Hymenoptera (Aculeata)" by Edward Saunders in 1902, a considerable number of changes in nomenclature and some additional species have been brought forward by various writers. From time to time I have noted these down and they are here collected together. I have not in all cases been able to verify the suggested changes myself, but have accepted the opinions of others, who have greater facilities and probably greater enthusiasm for making these investigations.

According to my own views Saunders's Catalogue needs also considerable and important changes in points of classification, but these are not dealt with here.

In the following list the synonyms, when given in brackets and without an author's name, indicate the specific or generic name adopted by Saunders in his Catalogue. Where a specific name is preceded by a lettered number it indicates an additional species to be placed after the species indicated by the same number in the Catalogue. A few questions I have left unconsidered, *e.g.* that of *Ceratophorus morio*, because such imperfect evidence as I have been able to obtain inclines me to the belief that Thomson's two species are not distinct—at least in so far as the supposed British exponents that I have seen. Again, in the case of the brown bumble-bees, are we to take Smith's evidence that the Linnean type of *muscorum* was that called *agrorum* in the Catalogue, when he examined it some three-quarters of a century ago, and that this fixes the name, or shall we consider that the inadequate description of Linnaeus applies better to the pale-haired form of *smithianus* and disregard the typical specimen?

PSAMMOCHARIDAE.

(*POMPILID.1E.*)

PSAMMOCHARES Latr.

(*POMPILUS.*)

9 a. *cardui* Perkins.

HYPsiceraeus Mor. & Durr.

(*CEROFALES.*)

SPHEX Linn.

(*AMMOPHILA.*)

PSEN.

(*MIMESA.*)

PSENULES Kohl.

(*PSEN.*)

DIODONTUS.

1 a. *friesei* Kohl.

ARPACTUS.*

(*HARPACTUS.*)

OXYBELUS,

sericatus Gerst.
(*mandibularis.*)

sp.?

(*nigripes.*)

argentatus Curt.

(*mucronatus.*)

CRABRO.

1 a. *kiesenwetteri* Mor.

nigritus Lep.

(*pubescens.*)

var. *inermis* Th.

7 a. *styrius* Kohl.

ovalis Lep.

(*anxius.*)

21 a. *planifrons* Th.

chrysostomus Lep.

xylurgus Sh.

interstinctus Sm.

ODYNERUS.

Subg. 1. OPLOMERUS.

(*HOPLOPUS.*)

4 a. *simillimus* Mor.

Subg. 2 LEIONOTUS.†

herrickii Sauss.

(*basalis.*)

* The genera *Arpactus*, *Gorytes*, and *Hoplitus* are distinct and should have been maintained by Saunders. In his "Synopsis" he expresses a strong opinion as to their validity. Apparently *Hoplitus* will be called *CEROFALES*!

† This name is, I believe, preoccupied, and it was suggested by Saussure that it should be called *Odynerus proprie dictus*. But that name must be applied to the *Symmorphus* section.

	COLLETES.*		ANDRENA.
glutinans Cuv.		carbonaria L.	
(succincta.)		(pilipes.)	
HYLAEUS F.		var. praetexta Sm.	
(Prosopis)		rosae Panz. 2nd brood.	
spilota Först.		eximia Sm. 1st brood.	
(masoni.)		5 a. trimmerana K. 2nd brood.	
minuta Fabr.		anglica Alfk.	
(brevicornis.)		rosae E. Saund. partim.	
SPHECODES.		spinigera K. 1st brood.	
gibbus L.		5 b. sp.	
dele monilicornis K.		trimmerana Auct. nec K.	
monilicornis K.		var. scotica Perk.	
(subquadratus.)		gwynana K.†	
3 a. seabriocollis Wesm.		varians Rossi.	
pellucidus Sm.		var. mixta Sch.	
(pilifrons.)		synadelpha Perk.	
divisus K.		(ambigua praeoec.)	
(similis.)		flavipes Panz.	
geoffrella K.		(fulvicrus.)	
(variegatus.)		gravidia Imh.	
HALICTUS.		(fasciata.)	
tetrazonius Kl.		marginata F.	
(t-cinctus.)		(cetii.)	
7 a. decipiens Perk.		tarsata Nyl.	
nitidus Panz.		(analis.)	
(6-notatus.)		nitidinseula Sch.	
calceatus Scop.		(lucens.)	
(cylindricus.)		sericea Chr.‡	
14 a. semipunctulatus Sch.		(barbilabris.)	
fulvicornis K.		(albicrus.)	
(subfasciatus.)		45 a. subopaca Nyl.	
16 a. freyessneri Alfk.		45 b. minutuloides Perk.	
subfasciatus Nyl.		45 c. parvuloides Perk.	
17 a. brevieornis Sch.		? 1st brood of 45 b.	
rufitarsis Zett.		spreta Pérez.	
(atricornis.)		(? niveata Fr.)	
minutissimus K.		46 a. alckenella Perk.	
var. arnoldi E. S. ♂.		46 b. moricella Perk.	
subauratus Rossi		? 1st brood of 46 a.	
(gramineus.)		46 c. sandersella Perk.	
		nana Saund. nec K.	

* According to Morice & Durrant, but the status of *Colletes* seems far from certain, and a careful re-examination of the type of *succincta* is desirable.

† Note that *bicolor*, the name of the second brood specimens, is prior to *gwynana*. That *bicolor* Fabr. is this species rests on the authority of Nylander, who, according to F. Smith, examined the Fabrianian types. The description of *bicolor* E. appears to agree better with *thoracica* E. If Nylander is correct the species should be called *bicolor*.

‡ *A. barbilabris* K. is prior to *albicrus* K. and should be used, if the species is not considered identical with *sericea*.

46 d. falsifica Perk.	22 a. conjungens H. S.
46 e. nanula Nyl,	flavoguttata K.
ovatula K.	rufocincta K.†
(<i>afzeliiella.</i>)	
wilkella R.	EPEOLUS.
var. convexiuscula K.	
CILISSA.	notatus Chr.
tricincta K.	(<i>productus.</i>)
(<i>melanura.</i>)	ernciger Panz.
DASYPODA.*	(<i>rufipes.</i>)
DUFOUREA.	COELIOXYX.
1 a. halictula Nyl.	trigonus Schr.
NOMADA.	(<i>conoidea.</i>)
rufipes Fabr.	? inermis K.§
(<i>solidaginis.</i>)	(<i>acuminata.</i>)
goodeniana K.	<i>spousa</i> Smith.
(<i>succincta.</i>)	
var. alternata K.	6 a. afra Lep.
marshamella K.	OSMIA.
(<i>alternata.</i>)	ventralis Panz.
flavopicta K.	(<i>leaiana.</i>)
(<i>jacobaeae.</i>)	STELIS.
13 a. flava Panz.†	ornatula Kl.
13 b. signata Jur.†	(<i>8-maculata.</i>)
13 c. bucephalae Perk.	PSITHYRUS.
<i>lateralis</i> Sm.	distinctus Pérez.†
leucophthalma K.†	BOMBUS.
(<i>borealis.</i>)	subterraneus L.
xanthosticta K.	(<i>latreillellus.</i>)
(<i>lateralis.</i>)	hortorum L.
hillana.	var. ruderatus F.
(<i>ochrostoma.</i>)	(<i>subterraneus.</i>)
germanica Panz.‡	ruderarius Müll.
(<i>ferruginata.</i>)	(<i>derhamellus.</i>)
	jonellus K.
	var. nivalis Sm.
	donovanella K.
	(<i>cullumanus.</i>)

In addition to these changes, which are sufficiently deplorable, others even more so will have to be made by those who admit the validity of the Erlangen list of Jurine's genera. As I believe that, sooner or later, the defining of a genus by the mere citation of a species, often itself

* Accidentally omitted in the Catalogue.

† Delete as synonyms in Catalogue.

‡ The insect described by Linnaeus had yellow tubercles and there was no type in his collection (*vide Kirby's "Monographia," under Apis ferruginata*). Panzer's name, *germanica*, is therefore safer.

§ Kirby's type should be examined.

imperfectly or superficially described, since such a rule is subject to the greatest abuse, will be disallowed, I have left these genera alone.

The notice of Jurine's work, written presumably by Panzer, but published anonymously, appears to me to be hardly more than an advertisement of a forthcoming book, which, as a matter of fact, was not published till a number of years later. Morice and Durrant tell us—the words in inverted commas are theirs, not Panzer's—that in 1799 Panzer wrote "that one Mr. Jurine of Bern was a very acute entomologist, who had got some 'method' of his own for determining insects by their wings, who had sent him (Panzer) such and such insects, giving him particulars of 'habitats' and was kindly going to give him more in future." Also that (in 1801) Panzer "will give it" (*i.e.* the New Method) "a start, but in a quiet way, taking no responsibility for anything. So he gives it a favourable notice, not at Nuremberg (where his authorship would be recognized at once), but at Erlangen, where a new *Zeitung* in which he had some sort of interest was being started. The thing would make good copy for an editorial and he could do his friend a good turn without bringing in his own name at all."

There is also another objection to the Erlangen list, as it appears to me, in that, though the list of genera was extracted from Jurine's proofs, the species which are supposed to confirm these genera were added probably by the anonymous author, who presumably was Panzer. As this author says: "To make lovers of these insects acquainted in advance with the genera established by this Method, the latter shall not only be communicated, but also placed over against the Fabrician genera published already, so that it will then be easy to compare these genera of Hr. Prof. Jurine with those of Hr. Prof. Fabricius." He also remarks that with the plates one can easily ascribe the genus even to "unpublished insects," that it is "almost impossible to go wrong," and I believe that the list of Fabrician names was compiled by the author of the Erlangen article and not by Jurine. So far as I have looked into the matter the internal evidence seems to support this.

Paignton.

Oct. 31st, 1918.

SWARMING OF THE CHALCIDID *PTEROMALUS DEPLANATUS* NEES
IN BUILDINGS.

BY HUGH SCOTT, M.A., F.L.S., F.E.S.

■ A paragraph on the swarming in rooms of myriads of *Pteromalus deplanatus* Nees (=*domesticus* Walker), appeared in "Nature," Sept. 19th, 1918 (vol. cii, p. 50). This note was based on information supplied by Mr. K. G. Blair, to whom had been submitted samples and particulars of swarms in various places.

The main purpose of the present article is to give details of a vast swarm of this species which has occurred for three years in succession (1916–18) at Hascombe, near Godalming, Surrey. Specimens sent to me late in 1917 were determined by Mr. Waterston, and recently the rector of Hascombe, the Rev. C. Sadler, has kindly sent me a much larger sample, taken from the 1918 swarm, with full information.

The buildings affected include all parts of Hascombe Church, especially the vestry, also the rectory and at least two other houses, one of which is a mile or more away. The invasion is not restricted to parts of buildings with a particular aspect, for rooms facing south, south-east, east, and north-west are all affected. But the insects do appear sometimes to keep to particular rooms in a house: thus, in the rectory they swarmed in the first year in rooms facing east, but in 1918 they also appeared, though in smaller numbers, in two rooms with a south aspect; while, on the other hand, in the house a mile away nearly every room is invaded.

The invasion begins about the middle of July and lasts, if the weather is seasonable, till about the end of August. This tallies with Walker's statement, written in 1835 (Ent. Mag. ii, p. 481), that the insect "occurs on the windows and walls of houses in infinite numbers during July, and more sparingly during the rest of the year." Mr. Sadler asserts definitely that, at any rate as far as his house is concerned, they *invade the rooms from outside*, usually on hot sultry days between about 11.30 and 4 P.M., and he has often closed the windows at such times in an attempt to stop the incoming hordes. This is interesting in connection with the seemingly unproved supposition that the parasites originate in the buildings from Anobiid beetles in the woodwork: if so, why should they enter these rooms from without? unless, indeed, they were bred from Anobiids in the woodwork of the church, and invaded the house from there. My informant also noticed that although they fly actively while outside, when inside the rooms they only crawl. Some hundreds sent to me during the first week in November emerged when

the box was opened and crawled about rather sluggishly, or suddenly jumped distances of about half an inch, but I saw only one fly, and that not more than one or two feet. During the autumn and winter they become sluggish and apparently moribund, but the starting of artificial heat in the church caused some resumption of movement and emergence from hiding-places. No revival in the spring has been observed at Hascombe, however warm the weather. Walker ("Zoologist," iii, 1845, p. 850) wrote that this *Pteromalus* lives throughout the year, being torpid in cold weather, though a mild day often draws it from its retreat. Its habit of getting into any kind of spaces, including those almost airtight, has been alluded to in the note in "Nature," and is fully borne out by the observations made at Hascombe, where the insects not only crawl all over windows and walls, herd behind pictures, on curtains, in books, inkpots, and boxes, but have found their way into a locked safe and a secret drawer in a bureau.

Besides the Hascombe swarm, particulars of others may be summarised as follows:—

Abinger Common, Dorking.—Specimens submitted to Blair. Mr. John A. Gibbs wrote on Aug. 24th, 1918, that the insects were then infesting a number of houses in the village in extraordinary numbers; in his house they swarmed on walls and windows, got under carpets and behind the glass of pictures; they were most numerous in rooms containing quite modern furniture and with very little woodwork, the walls and ceilings being plastered and distempered, so it is not likely that they originated from Anobiid beetles in the rooms.

Crawley, Sussex.—Specimens examined by Blair. Mrs. M. A. Middleton wrote on Oct. 30th, 1918, that her house had been infested by thousands of them for two summers, that they were still there at the time of writing, principally in rooms facing east, that they were attracted by lamps at night, and that on one occasion they still showed signs of life after the burning of a sulphur candle for three hours in a sealed-up room. This lady had not to her knowledge any woodwork infested by Anobiid beetles in the house.

Hever, Kent.—Specimens examined by Blair. Mr. E. G. B. Meade-Waldo wrote on Sept. 14, 1918, that they swarmed in a number of cottages and houses, and attracted everyone's notice. At the time of writing he thought they were decreasing somewhat, a spell of bad weather having commenced some time previously. He expressed the opinion that they did not originate in the houses, but came in from out-of-doors.

Felden, Herts.—Mr. Claude Morley writes that he has seen them in myriads in a house at Felden, but in what year is not stated.

In the Hascombe swarm and the samples sent to Blair, no other species besides *P. deplanatus* was found among the specimens. In the two following cases, particulars of which have been given me by J. C. F. Fryer, a critical determination of the Chalcidid was not made, and the

specimens have not been kept, but it seems almost certain that the same species is meant:—

Hayward's Heath, Sussex.—In a letter written on Aug. 1st, 1918, it is stated that they were in thousands in a house, in rooms facing north and south, but not in those having other aspects. They get behind pictures and make the walls look black in patches. They appear in August or the end of July, and seem to have infested the house for several seasons in succession. The house is on a hill-top, and surrounded by a wood of ash and oak.

East Grinstead, Sussex.—A record of a swarm was received on Oct. 31st, 1918.

Mr. Fryer has had other inquiries about the matter, but details have not been recorded. With the exception of Felden, Herts, all the above records are from Surrey, Sussex, and Kent, in which part of the country there seems to have been a remarkable concurrence of swarms.

There is no satisfactory explanation of these swarms at present, though the habit was known to Walker as long ago as 1835. Possibly the insects merely enter buildings for shelter, as seems to be the case with the immense swarms of Chloropid and other flies, about which much has been written. If so, their appearance as early as July is noteworthy, but would depend, presumably, on the season of emergence from their hosts and of their egg-laying*. Reasons for doubting whether they originate in the buildings where they occur, from Anobiid beetles in the woodwork, have been mentioned. They have been observed definitely to enter from without; moreover, would not incredible numbers of Anobiids have to be present for such myriads of parasites to be bred from them, even if many emerged from a single host? If Walker's other supposition—that one of their hosts is *Tortrix viridana*—be true, then the extreme abundance of the parasite during the last year or two is partly comprehensible, since *T. viridana* has been only too numerous, and has had a share in the serious defoliation of our oak woods.

Clearer information is needed as to the hosts of the *Pteromalus*. The older records are sometimes wanting in definite proof of the parasite being bred from a particular host, and it is doubtful whether the determinations of the species of *Pteromalus* are always correct. What has been written may be briefly summarised:

Audouin (1842, Hist. Ins. nuisibles à la vigne, p. 187) includes *P. deplanatus* among the enemies of the Vine Pyrale, *Sparganothis pilleriana*, but apparently

* Lesne (Bull. Soc. ent. France, 1909, p. 273), under the designation "sommeil hibernal précoce," records that as early as mid-July, 1904, numbers of a species of *Vanessa* were collected in groups in houses in a village of the High Jura; this was at an elevation of over 1100 metres, but July and August of that year in the High Jura were very hot, and the weather almost continually fine. He alludes also to numerous observations which have been made on the early appearance of *Galerucella luteola* Müll. in human habitations, the suggested explanation in this case being that excessive multiplication of the insect has led to exhaustion of its food-supply.

no real proof of this relationship is given. F. Walker (1844, Ann. Mag. Nat. Hist. xiv, p. 182) records it as bred in numbers shortly after the middle of June from *Tortrix xylosteana*; in the "Zoologist," (iii, 1845, pp. 850, 1142) he writes that it also parasitises *Tortrix viridana* and Anobiid beetles, but again no actual proof is mentioned. Dours (1874, Cat. Hym. France, p. 103) records it as bred by Perris from the weevil *Ceuthorrhynchus asperulus**, and this is copied by J. de Gaulle (1908, Cat. Hym. France, p. 101), and cited by Elliott & Morley (1911, Tr. Ent. Soc. London, p. 484). Dalla Torre (Cat. Hym. v, 1898, p. 120) mentions as host only *Tortrix xylosteana*. Connold (1908, Brit. Oak Galls, pp. 138, 151) records it from galls of the Cynipid *Teras terminalis* Fabr. Further information, either on the hosts or on the habit of swarming, has not been obtained from the literature, though all articles referred to in the "Zoological Record," from the date of publication of Dalla Torre's Catalogue (1898) onwards, which seemed likely to throw light on the subject, have been consulted.

Neither the sample from Hascombe, nor those examined by Blair, appeared to include any males. Walker stated that though the female may always be found, the only males he had seen were specimens bred by him—if indeed these were actually males of the species in question. Nees, however, appends to his original description (Hym. Ichn. aff. Monogr. ii, 1834, p. 111) the remark that he had seen both males and females in early spring and autumn on windows at Sickershausen (near Kitzingen, Bavaria), and had taken other specimens on flowers in May and July.

University Museum of Zoology, Cambridge.

December 1918.

Thalygra sericea Sturm in Cumberland.—This insect appears to be mainly southern in its distribution in Britain, although Fowler mentions it as very rare in the Moray district of Scotland. I can find no record of its occurrence in the north of England. It will be of interest therefore to note the capture of a single specimen in July last by myself while sweeping long grass under trees at Kingmoor near Carlisle. The specimen is much smaller and more pallid than others I have seen. My identification has been kindly confirmed by Mr. Newbery.—F. H. DAY, Carlisle : Oct. 23rd, 1918.

Endomychidae in Essex.—On October 19th, 1918, while examining a puff-ball (*Lycoperdon bovista*) in Hadleigh Woods, near Southend, I was pleased to discover a single specimen of *Lycoperdina bovistae* F. The beetle was exceedingly sluggish in its movements. Fowler (Col. Brit. Isls. vol. iii, p. 181) says: "very local, but generally in some numbers when found," but in this case further search for other examples proved futile. I may add that not far from this spot, my friend Mr. E. C. Day took three specimens of *Endomychus coccineus* L. on a damp tree-stump covered with boleti.—A. F. J. GEDYE, 4 Runwell Terrace, Westcliff-on-Sea : Oct. 31st, 1918.

* Presumably *Ceuthorrhynchidius posthumus* Germ. (= *asperulus* Boh.) is meant.

New localities for some interesting Hemiptera.—Amongst some Hemiptera recently sent me for naming by Mr. J. W. Carter, F.E.S., I was very glad to see a specimen of *Elasmostethus ferrugatus* Fabr., which was taken by Mr. Carter near Bradford, Yorks, in 1889. This is the third recorded British specimen of this species, and is really the earliest in order of time, as the other two were taken, respectively, near Bangor in 1899 by Mr. Sopp, and at Derby in 1903 by Mr. G. Pullen.

While staying for a short time in the south of Oxfordshire last August, I found the Homopteron *Grypotes pinetellus* Boh. in some numbers on Scotch fir on the Chiltern Hills at Goring Heath, and also a single specimen in the Thames Valley at Goring. This species has previously been recorded only from the neighbourhood of Mildenhall, Suffolk, where it was discovered a few years ago by the Messrs. Fryer. I also took from Lombardy poplars at Goring a pair of *Idiocerus scurra* Germ., a species which has hitherto been recorded only from the immediate neighbourhood of London.—E. A. BUTLER, 14 Drylands Road, Hornsey, N. 8: Dec 7th, 1918.

Delphax distincta Flor, and *D. pullula* Boh. in Cumberland.—Among a number of more or less interesting Homoptera recently submitted to Mr. E. A. Butler for names were four males and two females of the first-named species and a single male of the latter, all taken by me in June last by sweeping coarse herbage on Cumwhitton Moss. Both species were introduced to the British list by Scott without localities. Mr. Butler informs me that he knows of only one previous British *pullula* and none of *distincta*. My best thanks are due to Mr. Butler for his kind help, and also to Mr. James Edwards, to whom the insects were also referred.—F. H. DAY, 26, Curock Terrace, Carlisle: Nov. 22nd, 1918.

Crabro capitosus Shuck. in the Midlands.—In the Counties of Leicester, Warwick, and Northampton, this wasp, said by Saunders to be rare, must be one of the commonest of the genus. Its habit, perhaps, is obscure, for I have never caught it at large, but I have “bred” it freely, and this note on its economy may be the means of discovering whether the species is equally abundant elsewhere. When our hedges are trimmed the ash-twigs that are severed, as also those that are broken accidentally in woods, throw out a shoot on each side a foot or less from the end, thus forming a sort of trident the middle prong of which becomes dead. Into the pith of the central prong *Crabro capitosus* bores, but does not stop—as is the case with all other Aculeates boring in bramble and briar stems—at the dead portion of the twig; she bores far beyond, past the two new and growing shoots, right down into the green pith for twelve inches or so. The cells are provisioned with Aphides, and between each cell a partition, as long as or longer than the cell, is formed of minute loose pieces of green pith. There are usually nine or ten cells in a stem. The larvae make cylindrical cocoons of transparent yellow membrane and emerge (when the stems are kept indoors) in April and May, the sexes being about equally represented. In no case have I found cocoons in the dead part of the stem and only once in anything but ash, that once being in a growing elder-twig. I have not obtained any parasites. Wherever I look in the hedges in these three counties I am sure of finding perforated ash-twigs in

quantities, whereas perforated bramble and briar stems have to be hunted for diligently. Saunders says this species has been bred from bramble stems; may not this have been a mistake for ash?—L. A. Box, Eighty, Northampton Road, Croydon : November 16th, 1918.

Chrysopa dorsalis Burn. near Colchester.—I took nine specimens of this local insect in a young fir plantation near Colchester on June 17th, 1917, and a single example in the same locality in 1916. They were captured just before a heavy thunderstorm and were very lively in the net, in fact one or two others escaped. The insect has, so far, occurred nowhere else in Essex, and fir, to which it seems usually attached, is scarce near Colchester except for a few plantations of quite modern growth. This locality was in 1904–5 a sandy field and very prolific in Aculeate Hymenoptera.—BERNARD S. HARWOOD, Melford Road, Sudbury, Suffolk.

[*Chrysopa dorsalis* has previously only been recorded from two localities in Britain : at King's Lynn in numbers in 1900 and subsequently by Mr. A. E. Atmore ; and once at Oxshott in Surrey by the late Mr. Alfred Beaumont, also in 1900.—G. T. P.]

Note on the "singing" of Syrphus ribesii L. while at rest.—On Sept. 9th, 1917, in my garden here, the morning being warm and bright and autumn flies numerous on the flowers and shrubs, I became aware, while watching *Syrphi* hovering, of a "singing" sound which at first I thought came from an unfortunate fly in a spider's-web. Seeking the source of the sound, I was greatly interested to find that it came from a *Syrphus* resting on a leaf quite near. There was no doubt of it, as in this case (and in others) I got quite close to the fly without alarming it, and the sound was distinctly heard coming from the insect. I could detect no movement of any part. I caught several of these "singing" flies, and they were all *Syrphus ribesii*, ♂♂. During the past summer (1918) I did not, owing to various reasons, notice this habit until the new brood of *Syrphi* were about in Aug. and Sept. From observations made, the "singing" seemed to be confined to the ♂ of *S. ribesii*, which I may remark is the predominant member of the genus in my garden ; its near relative, *vitripennis* Mg., is comparatively scarce, and I did not catch any "singing." I also paid close attention to *tuniger* Mg., *balteatus* D. G., and *corollae* F., but detected no sound coming from them. When *ribesii* ♂ settles, its wings are sometimes rather widely spread, and it is only after bringing them, with a sudden and quick movement, closer together over the abdomen—but still leaving the latter uncovered—that the "singing" begins. I could not see that ♀♀ were attracted by the sound, and I could come to no other conclusion than that it was an expression of the insect's joy in life. The brighter the sun, the more active the insects were, and the more they "sang"! The sound was distinctly audible to me at a distance of six or seven feet. I cannot find that this habit in *S. ribesii* has been noticed before. It is not mentioned in the latest account of the *Syrphidae* (Lundbeck, "Diptera Danica," part v, 1916). It is, of course, known to occur in the genera *Helophilus*, *Sericomyia*, and *Microdon*. I have noticed it in *Sericomyia*, and the sound is louder than in *S. ribesii*. Interesting notes on the "singing" of *Sericomyia* appeared in Vol. 18 (pp. 159, 189, 190) and 19 (p. 188) of this Magazine.—A. E. J. CARTER, Monifreth, Forfarshire : Oct. 21st, 1918.

Machimus atricapillus Fln. in Lancashire.—According to Verrall in his "British Flies," vol. v, p. 678, this species has not been taken further north than Dolgelly. On the 8th of August last I took a pair at Humphrey Head, near Grange, which is about 100 miles further north. I have also taken *Echinomyia grossa* L. several times on Holker Moss in the same neighbourhood.—CHRIS. A. CHEETHAM, Farnley, Leeds: Dec. 11th, 1918.

NOTE ON *APANTELES GLOMERATUS*, A BRACONID PARASITE OF
THE LARVA OF *PIERIS BRASSICAE*.

BY J. BRONTÉ GATENBY, B.A., B.Sc.

The endoparasitic entomophagous *Hymenoptera* have always attracted the lively interest both of the systematist and the trained microscopist. Except for the colonial instinct, these entomophagous *Hymenoptera* exhibit other reactions and complicated instincts of a truly wonderful nature (1).

In this short note I have added a few more facts to a former paper (2) on the subject, wherein I described the larval anatomy of *Microgaster*, an allied form.

The adult *Apanteles glomeratus* is a small Braconid fly some three millimetres in body-length. It generally attacks young caterpillars of *Pieris brassicae*, and lays inside their bodies some thirty to sixty eggs, all of which hatch out, producing larvae with a peculiar abdominal bulb or vesicle (2). These larvae grow up, eating the fat-body of the host in later stages of their life. Finally they make their exit from the body of their host, at a time when the latter is about full-grown. This paper deals especially with the period when the Braconid larvae are passing outwards.

SOME FACTS WITH REGARD TO THE EGG AND
GENERAL DEVELOPMENT.

The oogenesis of this parasite has been examined by Hegner (3) and more recently by myself. I do not intend to enter into the subject here, but it may be explained that the ovum of this form is an elongate-oval structure, having at its posterior pole a germ-cell determinant (3, 1), which later becomes enclosed in the future germ-cells. In oogenesis also it has been ascertained by Hegner that *Apanteles* is like Blochmann's ants and some other insects in possessing, in addition to the egg-nucleus, a large number of secondary nuclei, whose origin and fate is still in doubt. They appear when the egg is half grown and disappear before the egg is quite mature. Lately, Buchner (4) has

published a monumental work on these secondary nuclei in *Hymenoptera*, without, however, adding any very important new fact to our knowledge. These secondary nuclei are undoubtedly most remarkable objects, and further study of them may shed some light on the structure of the true nucleus.

The development is completely unknown except for some embryos studied by me in my former paper.

The larvae of *Apanteles*, *Microgaster*, and *Microplitis* are remarkable for the fact that they respire by means of an abdominal vesicle, which has hitherto been considered to be the modified ultimate segment of the abdomen. In my previous paper I have advanced reasons based on strong anatomical evidence that all the older observers are incorrect in considering this vesicle or bladder to be a body-segment; I consider that it is a part of the gut or proctodaeum evaginated during embryonic development. Complete confirmation of this suggestion can only come by the examination of successive embryonic stages, which are difficult to obtain. I have so far been unable to succeed in getting the *Apanteles* to attack Pierine caterpillars in captivity and thus to get the eggs at special stages, and have had to depend on material collected outside.

Note on Gautier's New Work.

Cl. Gautier (Comptes Rend. lxxxi, 1918) gives two short papers on a period of the history of *Apanteles* not studied by me. He finds from 15 to 80 *Apanteles* individuals to emerge from one host Pierine; the average number is sixty. With reference to the period of life at which the host caterpillar becomes infected, Gautier mentions Fabre's incorrect view that it is the *Pieris* eggs that are attacked by the parasite; Seurat thought that it was the young caterpillars of 3 mm. in length that were pierced by the *Apanteles*; this is Martelli's observation also (2).

Gautier performed the following experiment:—*Pieris* eggs taken in the open and kept in gauze cages, do not give rise to parasites. This contradicts Fabre: caterpillars of *Pieris* ranging from 24 hours old to 8–9 mm. in length, taken in the open and kept in gauze cages, are found to give rise to parasites. This means that the mother *Apanteles* is able to oviposit in Pierine caterpillars up to 9 mm. in length. Gautier confirms Martelli's work, which, however, he does not seem to know. (For bibliography, see paper (2).)

EXIT OF THE *APANTELES* LARVAE FROM THE HOST CATERPILLAR'S BODY.

In my previous paper (2) I mentioned that the parasitized caterpillar, some time before the boring outward of the Braconid larvae,

remains quite still; if it is touched, the caterpillar moves a little, but soon becomes immobile again. This enforced immobility is caused possibly by the movements of the larvae inside the caterpillar's body; at some signal all the larvae within the latter become active preparatory to their exit.

The reason the unfortunate host does not struggle at this stage is possibly due either to a partial nervous paralysis or, more likely, to a rupture of many of its body-wall muscles. That the latter explanation is near the truth is made more likely by the facts that in many cases the exit of the parasites is preceded, first, by violent struggles of the host, and then by a period of immobility, and by the additional fact that the head and prothoracic regions of the caterpillar throughout the periods of boring outward, make a slight but constant movement; this region of the caterpillar is rarely punctured by the out-boring parasites (text-fig. 1).

After the caterpillar is immobile, examination of its body-wall at a favourable time may show a large number of round pale whitish spots. These pale areas are caused by the contained parasites beginning to eat or gnaw their way outwards; in doing this they firstly gnaw away the muscles and hypoderm. As the latter is pigmented (yellow or brownish black) the scraping away of the cells causes the round areas to appear. In text-fig. 2 the mesothorax above the letter *p* is seen to have in the mid-lateral region a round pale area, caused as explained above. Watched under a binocular microscope the somewhat pigmented head of the parasite may be observed underneath moving to and fro as it rasps at the cuticle of its host. After the first appearance of these round areas the parasites take about fifteen minutes to penetrate through the remaining outer elutinous cuticle.

In several cases I have been enabled to examine the stages in the exit of these Braconid larvae from the body of the *Pieris brassicae* caterpillar, and I have carefully noted the times at which the parasites were at special stages in their process of exit. In the following paragraphs I give a specimen of these observations, one of which began at 9.30 A.M. The exit of the parasites may take place at any time of the night or day.

1. The outward migration of the parasites began at 9.30 A.M.
2. From the time of appearance of the white scraped areas to the complete penetration of the body-wall, 30 minutes passed. 10 A.M.
3. From the time of first breaking through of the head of the parasite to the extrusion of half its body, 30 minutes passed. 10.30 A.M.

4. In another 10 or 15 minutes every larva has extricated all but the last abdominal segment. 10.45 A.M.
5. Immediately they began to spin up. By 11 A.M. each larva had spun a loose outer net halfway up its body (text-fig. 4, *w*).
6. In the following hour only the tip of the head protruded (text-fig. 2, on right side of *p*). 12 P.M.
7. By 3 P.M. the outer network of the web was finished and the inner closely woven shell was in process of formation, though the larvae could still be seen through, working steadily.

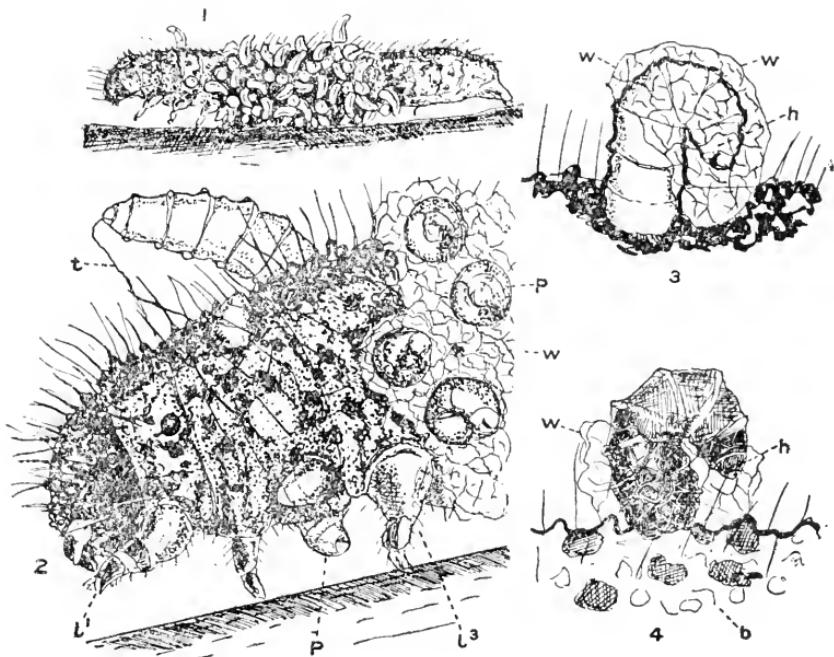
Complete time from beginning of emergence, $5\frac{1}{2}$ hours. By the following morning the cocoons were nearly completed as far as one could judge from an external examination.

A striking fact is the apparent synchronism in the inception of the outward movement by every larva. Some stimulus evidently becomes passed from one to the other. Kept on one's desk and occasionally examined, a box of "sleepy" Pierine caterpillars are at one moment normal. In the space of ten minutes or so, an individual may resolve into a mass of struggling white maggots, as drawn in text-fig. 1. The change is remarkable, and the question naturally arises as to what is the nature of the stimulus which sends every larva rapidly boring outwards. I believe that the outward movement is not really so synchronous as cursory examination seems to show; what probably occurs seems to be that when the larvae are full-grown, their imaginal discs, silk glands, and general histolytic processes having arrived at the correct stage, an inward physiological stimulus arises in a few of the most advanced individuals, and it is their struggles outward that sets the others working likewise.

In this connection some interesting facts have been noticed. In such a case as that shown in text-fig. 1, almost every individual has attempted to work outwards in the middle third of the body; this region is crowded, but not all larvae have succeeded in their fight for a space in this favourite region; ten minutes after the stage shown in text-fig. 1 more larvae began to appear in the thoracic and the hind abdominal regions. These larvae were not immature in size, and I considered that their lateness in appearance was due to the fact that they had been unable to obtain a footing in the mid-region, and had been forced to work along underneath their more successful fellows to gain a place for commencing boring operations.

It was shown before (2) that the parasitic larvae generally passed outwards through the sides of the host caterpillar. More rarely one finds larvae passing outwards on the dorsal surface, but no matter in

which position the host caterpillar adheres to a wall or tree, the majority of larvae attack the sides of the host. This does not seem to be a general rule for other Braconids. In addition, there seems to be some evidence that the larvae have a geotropic sense; if a parasitized caterpillar is lying at the bottom of a square box, with its body parallel to the side of the box, and one side facing upwards and the other touching



Text-fig. 1.—Caterpillar of *Pieris brassicae* at a time when most of the *Apanteles glomeratus* larvae have made their exit from its haemocoel.

- „ 2.—Head region of same showing mode of exit of parasites (P): l=leg; t=thread of silk: w=outer layer of cocoon.
- „ 3 and 4.—Early stages in spinning of cocoon after emergence of larva from body of host (b): h=head of larva; w=web.

the floor of the box, almost all the larvae emerge on the upward side. A few may pass outwards on the underside, but not many; others pass outwards on the true dorsum of the caterpillar, but the majority prefer the upper lateral side. This is the case shown in text-fig. 1.

In text-fig. 2 the head end of a parasitized caterpillar is drawn at a higher magnification. This gives a faithful idea of the mode of exit of the parasites; on each side of the pale circle in the mid-lateral region in the mesothorax, there is a larva just beginning to emerge; at p, another larva is issuing on the ventral surface. At t is the web being spun by

the larva which has emerged on the dorsum. All these above-mentioned larvae were late in emerging. At *w*, is the loose outer web of those larvae which had emerged sooner and which are now nearly hidden.

In several cases immediately after the parasite had emerged, I removed it from the surface of the body of its host and placed it on a glass plate; nevertheless it began at once to spin its cocoon. Disturbed and shifted several times, the parasite will at each time patiently begin again to spin its cocoon. It is extremely rare, however, to find any larvae further than half an inch from the body of the host. The spinning of the cocoon seems to follow as a reflex after the emergence of the larva from the carcass of the caterpillar.

ON THE CONDITION OF THE BODY OF THE HOST CATERPILLAR AFTER EMERGENCE OF THE PARASITIC LARVAE.

Those who have had occasion to open the body of a Lepidopterous larva containing one or more Tachinid larval parasites must have been surprised at the complete manner in which the adult caterpillar's body has been cleared out of all but necessary organs. In cases I have examined hardly a vestige remains of the fat-body. On the analogy of Tachinid parasitism one might expect to find the same to apply to the adult Pierine caterpillar parasitized by *Apanteles* larvae, which also in the last third of their larval life consume the fatty tissues of their host. I have cut sections of the parasitized caterpillar before and after the exit, and find that, as one would expect, the condition of the fat-body depends on the number of parasites in the host. In all cases, however, thin sheets of fatty tissue remain after the exit of the larvae; but when only a few parasites are in the body of the caterpillar, the fat-body may be rather extensive. In such cases the caterpillar may arrive at the pupal stage. I have met no case in which such an individual gave rise to an imago, but I believe this has occurred, and has been reported.

In my sections of the caterpillar after exit of the larvae, the holes in the body are found to appear as gaps, or complete breaks in the section of the body-wall.

In the several cases examined, I found that caterpillars killed some days after emergence of the bulk of the parasites contained one or more which did not emerge with the others. Whether these were alive, or why they did not emerge with their fellows, I do not know.

In both Tachinid and Braconid parasitism the size of the gonads is nearly always seriously affected, and such individuals have no spermatozoa developed, as have the unparasitized Pierine caterpillars. In no

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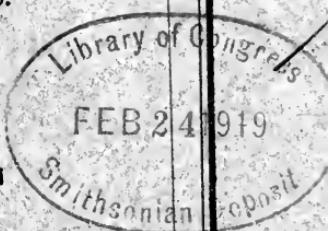
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ease had the gonads been destroyed by *Apanteles* or *Microgaster*, or by any Tachinid parasites examined by me. This is true even when all the fat-body has been removed from the immediate environs of the gonads.

THE COCOON OF THE *APANTELES* LARVA.

After the parasites have passed out of the body of the victimized Pierine caterpillar, they adhere to the latter by the last abdominal segment, which does not appear to be completely withdrawn at once from the hole in the body-wall. Immediately the parasites have completely escaped, they begin to spin their cocoons. Those of *Microgaster connerus*, a parasite especially of *Porthesia similis*, are a beautiful white, while those of *Apanteles glomeratus* are of an equally beautiful golden yellow colour.

The larva of *Apanteles* bends over as shown in text-figs. 3 and 4, and spins first of all a loose outer web around its body. In the majority of cases it carries out this process as illustrated in text-fig. 4, beginning at the bottom and gradually working upwards. In rarer cases it builds the net from one side as shown in text-fig. 3. In the region where all the larvae are crowded together, one larva attaches some of its threads to those of its neighbours. The larva loops its first threads on to the hairs of the caterpillar's body, but the attachment is never very close, and the host is easily separated from its parasite cocoons. The times taken for the preliminary steps of the formation of the cocoon have been given, but after the latter is so thick that the occupant can no longer be seen through, it may work several hours longer before the silken casket is finished. As is well known, the cocoon is extraordinarily tough and strong. In my previous paper notes were given on the method of exit of the imago from its cocoon, as well as of the hyperparasite *Mesochorus*.

THE FATE OF THE PARASITIZED LARVA OF *PIERIS*.

The parasitized larvae of Pierines appear to be able to grow just as large as the non-parasitized individuals. After the exit of the larvae, the host caterpillar is left overpowered by the dreadful experience it has undergone. If it is touched it moves feebly, but for several days its power of movement is curtailed; in about a week's time after the exit of the parasites from its body, the holes probably become repaired and filled up by the activity of the blood or body-wall cells. It is true that after the exit of the larvae the body-fluid of the host can be expressed by gentle squeezing, though if the caterpillar is not touched the exit of

the parasites does not appear to let out any blood. It is a well-known fact that the intestines and fluid in the body of a caterpillar are slightly under pressure, and the puncturing of its body-wall with a needle generally lets out at least a drop of haemocoelic fluid. Now this pressure is of course no longer present after the exit of the parasites; the host's body shrinks somewhat, and it is not till the holes are repaired by the cells, and the body-wall of the caterpillar has shrunken further, that the pressure becomes renewed. This happens at the end of a week; at this stage rough handling of the caterpillar may rupture some of the holes, and immediately a drop of haemocoelic fluid exudes.

Subsequently, the caterpillar recovers to a certain extent, and in many cases it can make spasmodic movements of its whole body, when stimulated. In rare cases it is able to travel a short distance from the mass of cocoons. I have found *Pieris brassicae* larvae to live at least one month after the exit of their parasites; during this period they move very little, though head movement may occur at periods, and they finally become dried up and die.

Examination of the haemocoelic fluid of parasitized larvae failed to reveal any very obvious differences when compared with the blood-fluid of non-parasitized caterpillars.

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24, Walton Well Road, Oxford.

December 1918.

NEW AND LITTLE-KNOWN SALTATORIAL DASCILLIDAE: SUPPLEMENTARY NOTE.

BY G. C. CHAMPION, F.Z.S.

During the course of publication of this paper, the concluding portion of which was issued in December 1918 (Ent. Mo. Mag. liv.), two species of *Scirtes* from Fiji have been handed over to me for determination; and an example of *S. subcostatus*, i.e. p. 193, from N.E.

Rhodesia, found by Mr. Neave between Luwingu and the mouth of the Chambezi River, has been detected in the Oxford Museum*. Descriptions of the Fijian forms, the first to be received from those islands, are now given.

Scirtes natovensis, n. sp.

Oval, rather broad, robust, shining, finely pubescent; fusco-testaceous or reddish-brown, the head and prothorax piceous, the sides of the latter rather broadly and sharply, the antennae, and an indeterminate humeral patch, testaceous, the legs obscure testaceous; very closely finely, the elytra more strongly, punctate. Head very broad; antennae slender, long, joints 2 and 3 short, equal in length. Prothorax rapidly narrowed from the base. Elytra without trace of grooves on the disc, the margins very narrowly reflexed. Posterior femora extremely broad; upper posterior tibial spur rather slender, about three times the length of the feebly developed lower spur, the upper one much shorter than the first tarsal joint.

Length $3\frac{3}{4}$, breadth $2\frac{1}{10}$ mm.

Hab. FIJI, Natova (*R. Veitch*: iv.1918).

Two specimens in fairly good condition, others rendered useless by pinning. Near the variable, widely distributed *S. sericeus* Waterh. (? = *canescens* Motsch.), the type of which was from Siam, differing from it in the sharply defined pale margins to the prothorax and the feebly developed lower spur to the posterior tibiae.

Scirtes veitchi, n. sp.

Oblong oval, somewhat depressed, shining, finely pubescent; black, the two basal joints of the antennae, the sides of the prothorax, knees, tarsi, and tips of the tibiae, rufescent or testaceous; closely, minutely, the elytra more strongly, punctate. Antennae moderately long, slender, joint 3 very small. Elytra without trace of grooves, narrowly margined. Posterior femora broad, the tibiae moderately dilated, the spurs rather slender, the lower one short.

Length $2\frac{2}{3}$, breadth $1\frac{1}{2}$ mm.

Hab. FIJI, Natova (*R. Veitch*: 10.i.1918).

One specimen, in good condition, with the posterior tibial spurs of the right leg connate at the base. Near *S. nigricans* Waterh., from China, and *S. consobrinus* Lewis, from Japan, but less convex, the antennae black (joints 1 and 2 excepted); the lateral margins of the prothorax red, the elytra more strongly punctured.

Horsell.

December 1918.

* Two more specimens from Entebbe have just been handed over to me by Dr. Guy Marshall, these having the elytral ridges almost obsolete, and this character may therefore apply to ♂ only, the type being ♀.

TWENTY-FIVE YEARS IN SOUTH DEVON. A LEPIDOPTERIST'S
RETROSPECT.

BY C. M. MAYOR.

Since August 1914, no light has been allowed on the coast—a very necessary restriction, but one that at once put an end to all collecting by night at seaside places. Not unnaturally, perhaps, one's thoughts revert to happier times, and I have lately been looking through the pages of an Entomological Diary, from which these notes have been gathered.

It must be nearly twenty-eight years ago that I first started collecting *Lepidoptera* in South Devon. So far as I know, there was only one other collector in the town where we came to reside, and he, like myself, was not over fond of working alone, so had consequently done little since coming down West. A chance meeting soon revealed our hobby, and we at once determined to start an organized campaign together. From that day, with a few unavoidable intervals, we systematically and perseveringly worked our neighbourhood, generally in company, and it is in order to give some results of our combined efforts that this little account is written.

For the first few years most of our collecting was done in a small private wood, situated about a mile from the sea, and this produced a surprising number and variety of insects. We worked it with light, sugar, "dusking," and all the usual methods, and, considering its small extent, we were well repaid. Some of the moths taken there we never obtained elsewhere in the neighbourhood, such as *Eidonia piniaria*, *Angerona prunaria*, and *Eurymene dolobraria*, and nowhere have I seen *Culligenia miniata* in such profusion. *Epunda nigra* and *Cleora lichenaria* were especially abundant; also *Corycia taminata* and *C. temerata*.

Sallows in the region of this wood, as indeed elsewhere in our district, usually proved unsatisfactory, because, in the south-west of England, they come into bloom so early, at a time when the weather is very unstable. After a mild winter I have known the bushes to be in bloom at the end of January, and just when you think they are at their best, a sharp frost or gale of wind will completely destroy their attractiveness. Nevertheless, we occasionally got in a good evening, and managed to take *Dasympa rubiginea* not infrequently. It occurred several years running—1894, 1895, 1896, etc.—once in company with *Hoporina croceago*. We sometimes took *Taeniocampa miniosa*, and one year *T. gracilis* was quite plentiful. But, on the whole, sallows were very disappointing, producing only the usual *Taeniocampas*, with a few odd hibernated "wrecks" of no importance.

My friend was extremely fond of working the street-lamps, and on suitable nights, if not otherwise engaged, either he or I generally took a stroll round at about 10 p.m. with a light, long-handled net and a supply of boxes. We had a particular "beat," which experience had shown us to be profitable, and the list of moths taken in this way would be a long one, comprising probably not less than 200 species, some of them being far from common. I have actual records of over 170, but there are many omissions, especially amongst the commoner species and *Eupitheciæ*.

I suppose that *Campylogramma fluvia* was one of our "plums," and, though not constant, the late autumn brood put in an appearance most years. A specially good year for *fluvia* was 1899, when we took some twenty specimens, the best night being November 23rd, which I remember very well as being still, warm, and as black as ink. I boxed six *fluvia* that night—4 ♀ and 2 ♂, the former all being taken, curiously enough, on one lamp in a public park. The females were kept—and sacrificed—for ova, of which we got a good supply, the resulting larvae being reared then, as on other occasions, without difficulty. Besides *fluvia*, the following may be worth recording, and it is interesting to note that they were mostly taken within a radius of half-a-mile from our house:—

Acherontia atropos, *Choerocampa elpenor*, *C. porcellus*, *Amphidasis prodomaria*, *A. betularia*, *Cymatophora ridea*, *Neuria saponariae*, *Caradrina ambigua*, *Demas coryli*, *Epunda nigra*, *Aeronycta ligustri*, *Dasypolia templi*, *Heliothis peltigera*, *Laphygma exigua*, *Polia flaccincta*, *Cosmia diffinis*, *Liparis chrysorrhœa*, *L. monacha*, *Gonophora derasa*, *Dicranura vinula*, *Calamia lutosa*, *Lobophora viretata*, *Calligenia miniata*, *Lithosia cauiola*, *L. griseola* (in great profusion), *L. griseola*, var. *stramineola*, *Macaria notata*, *Ellopi fasciaria*, *Pericallia syringaria*, *Ennomos fuscantaria*, *Anticlea sinuata*, *Platypteryx humula*, *Aporophyla australis*, *Epione apicaria*, *Geometra papilionaria*, *Corycia taminata*, *Numeria pulveraria*.

We devoted a great deal of time to sugaring at all seasons of the year save winter itself, and, taken all round, we found it probably the most profitable means of collecting. Given average fair weather, I should say that in our district the month of September is the best of the twelve for this purpose, and anybody visiting Devon for, say, an entomological holiday, could hardly do better than select the last week in August and the entire month of September, except, of course, for certain species occurring earlier in the year. The results of our sugaring

were very variable, as is generally the case, some years being absolutely hopeless with hardly a redeeming feature, whilst certain seasons stand out in red letters. 1897 and 1899 were good; 1900 positively golden; and 1906 much above the average. We were firm believers in steadfastly adhering to one spot and continually working it rather than wandering about, if at any time unsuccessful, from place to place, in the hopes of better fortune. When sugaring in our wood, we invariably occupied the same ride, making a complete circle through the surrounding orchards. By the sea we selected our run of posts supporting a wire fence close to the edge of the cliffs, with a hill sloping away landwards, covered with scrub and affording much shelter to our "sugars" when the wind came from that quarter. The surrounding country was mostly rough grassland, open common, and limestone quarries, and we found this spot so satisfactory that we ultimately forsook the wood and for quite twenty years running regularly sugared here throughout the summer and autumn. It is out of the question to enumerate all the species that have from time to time visited our sweets. I have referred, later on, to a few of the better and more particularly South Devon moths in some short notes upon them individually. In addition to these, I may mention the following:—*Agrotis obelisca*, *A. lunigera*, *A. saucia* and *A. suffusa* (some years in extraordinary abundance). *A. puta*, *A. porphyrea*. *Epunda nigra* (generally very common), *E. lutulenta*, *E. lichenea*. *Thyatira batis*. *Gonophora derasa*, *Cosmia affinis*, *C. diffinis*, *Caradrina utsines*, *C. blanda*, *Polia flavigincta* (very fine dark form), *Hadena genistae*, *Apamea fibrosa*, *Calocampa vetusta*, *Noctua neglecta*, *N. glareosa* (a pretty pink form), *Aporophyla australis*, *Plusia festucae*, *Aplecta occulta*.

I think that the month of September, 1900, was the best and most successful period we ever had at sugar, and some remarkably fine "bags" rewarded our efforts. The weather was perfect and insects swarmed, including species of some rarity.

In Devon and Cornwall, as, no doubt, in other counties, the railway is frequently a blessing in disguise for the collector. The steep banks of the cuttings are often a mass of varied vegetation, including many uncommon and local plants; they are generally more or less protected from the vagaries of the weather and afford a fine harbour to countless insects—not only Lepidopterous. If passing through suitable country, both inland and by the sea, the wooden posts supporting stout wire-fencing, as used by the Great Western, make ideal vehicles for sugar and I have found splendid sport in such situations again and again.

In my humble opinion great rewards still await the persevering collector, particularly if *resident*, in South Devon. In view of the good things that have been taken, who can say what is in store for others? There were, first, Mr. Jäger's *Ophiusa stolidula** in 1903, which I had the pleasure of seeing the morning after capture; then my friend's fine *Nonagria sparganii* in 1899; also his two *Nola albalalis*. Certainly four *Leucania extranea* (three of which were taken on ground I have worked scores of times) and *Hypena obsitalis*, whose fortunate captor I know well. *Heliothis scutosa*, *Sterrhia sacraria*, *Plusia ni*, *Dianthoecia barrettii*, *Deiopeia pulchella* (which was taken by a friend in my neighbourhood), and many others.

For reasons which are difficult to discover, South Devon seems to have been much neglected during recent years. In pre-war days I have often been for walks on summer evenings over ground that, from an entomological point of view, is almost historic, without meeting a single collector. Twenty years or more ago I should probably have encountered parties of our leading entomologists. Perhaps, however, they imagined, as is so often the case, that others would be there before them, with the result that miles of the finest collecting ground in the south-west of England have been entirely neglected year after year, save, perhaps, for the occasional visits of residents in the neighbourhood. The following notes on a few special species may, I hope, prove of interest.

Leucania putrescens.—Our experience with this essentially Devonshire moth is worth noting. Considering that it was, we knew, taken freely at a well-known locality not many miles away from us, we thought it strange that not a single specimen appeared on our own ground. On the advice of an old and experienced collector, who had taken *putrescens* plentifully in the earlier days of its discovery, we sugared the blooms of the wild carrot as near the coast as we could go, but without, at first, any success whatever. A few years later, however, about 1898 probably, *putrescens* began to put in an appearance. Strangely enough, we first took it at bramble blossoms. Subsequently it came to sugar; but we took more when the latter was spread on posts and fencing than when we sugared the flowers; and this was a great blessing, as examining long stretches of low-growing flowers is a very tedious occupation. We soon discovered, however, that there was something far more attractive to *putrescens* than sugar, viz. the flowers of the wood sage (*Teucrium scorodonia*). In the year 1902 I made a note in my Diary as follows:—“*L. putrescens*, decidedly on the increase, and now occurring in some

* See Ent. Mo. Mag. vol. xxii, 2nd series, p. 203, and plate.

numbers every year, chiefly at wood sage. If this plant is about, sugaring for the moth is hardly worth while, as, by examining the flowers after dark with the aid of a lantern they may be seen without difficulty." As illustrating the comparative attractiveness of the two baits, I give the following extracts from the same Diary:—"1905, July 15th, 7 *putrescens*: 6 on sage, 1 on sugar; July 20th, 6 on sage; July 21st, 10: 8 on sage; July 26th, 15: 10 on sage; August 1st, 10: 8 on sage; August 5th, 4 on sage," and so on. No doubt that when we first started this insect was not nearly so plentiful as it subsequently became. The second or third week in July generally finds it well out, though I have taken it earlier, and sometimes it continues in fine condition to the end of August or even later.

Leucania albipuncta.—I suppose South Devon would generally be regarded as quite a good locality for this insect, but, though we have worked for it over many years, we have not taken a great number. In 1897 we got 4; 1899, 3; 1900, a good year, about a dozen; and so on—a few, as a rule, most seasons. Generally speaking, as a result of persevering sugaring in late August and into September, *albipuncta* will be found to come sooner or later on still, dark, and warm nights. It is a great mistake to leave the sugars early, as, although it may be taken on one's first round, this moth continues to visit the sweets all night, and we have found it on our way home after midnight on the patches of other collectors who had long since gone home and were probably then in bed and asleep. Personally, I have never taken more than three in a single evening, but my friend Mr. G. T. Porritt once had the good fortune to get five one night on the very ground I have many times sugared. No one who has once seen *albipuncta* in the lantern's rays could possibly mistake it for *L. lithargyria*, which it is said to resemble. Not only does it look an altogether *superior* insect, but the spots stand out very conspicuously like points of pure white.

(To be continued.)

Paraphytosus: a correction.—In my description of this genus (Ent. Mo. Mag. 1917, p. 125) I stated that the tongue was simple. Examination, however, of other preparations of the mouth-parts shows that a small, acutely triangular excision of the apex is present, and therefore that the statement that this structure is simple is incorrect.—M. CAMERON, 7 Blessington Rd., Lee, S.E. 13: January 6th, 1919.

Bryocaris (Megaceronus) analis Payk. var. *merdaria* Gyll. in Wales.—This well-marked colour variety differs from the type form in having a bright red

instead of a black thorax. Stephens includes it in his Manual, but I believe that it has not found a place in any British handbook or catalogue since his time, nor have I any recollection of a record of its capture here. A specimen was taken by my friend Mr. C. E. Stott in moss at Llandrindod Wells in September 1917, and sent to me for identification.—E. A. NEWBERY, 13 Oppidans Road, N.W. 3: *January 14th, 1919.*

Gerris asper Fab. in Norfolk.—In March 1918, I took three specimens of a *Gerris* on a slow-flowing brook at Holt, Norfolk. Mr. E. A. Butler, to whom I submitted one of the examples and to whom my best thanks are due, informs me that they are *Gerris asper*, and that he knows of no other authentic occurrence of this insect south of the Tweed.—G. E. HUTCHINSON, Ayrthorpe, Newton Road, Cambridge: *January 17th, 1919.*

*The range of *Phusia moneta* in Britain.*—Dr. Imms's record (this Magazine, liv, p. 211) of this species for Lynn certainly carries it a little further west than Bramhall ("Entomologist," xxxix, p. 291), but his records are beaten, so far as the north of Cheshire is concerned, by Sale (Ent. L. c.), and Ashton-on-Mersey (Ent. 1, p. 208) and all Cheshire records are beaten easily by York (Ent. Mo. Mag. liv, p. 21). There is now a "further west" record for Cheshire in the current number of the "Entomologist," p. 23 (Alvanley). I have also a note of the larva being found at Arnside, Westmorland, which is the farthest north as yet, but I cannot trace the source of the record now. Perhaps some reader can put me on to it. We want records of this species from N. Wales, Isle of Man, Ireland, and Scotland. Has it not reached any of these districts yet?—C. NICHOLSON, 35 The Avenue, Hale End, E. 4 *December 5th, 1918.*

Bombus terrestris L. in New Zealand.—Is not Mr. Hudson in error (last vol. p. 212) in speaking of *harrisellus* Kirby as a variety of above species? I thought it belonged to *hortorum* L., or, more correctly, *ruderatus* F. according to Sladen.—C. NICHOLSON.

*The "singing" of *Syrphus ribesii* while at rest.*—I notice that Mr. Carter, in his notes upon this subject, states that he was unable to observe any motion when these flies were producing their shrill singing noise; but I think if he watches them again very closely he will find that the wings are really in motion at the time. The movement is very slight and exceedingly rapid—indeed, the only effect that is produced is that the wings suddenly appear out of focus when the song is commenced. The change is, perhaps, more easily seen when the song ceases, for then the outline of the wings becomes suddenly much sharper and more distinct. There are some other flies of the same genus that I have noticed producing a similar noise, but I cannot be quite sure from memory as to which species I have observed. I suspect the sharp buzzing sound they all make when caught is produced in the same way.—EUSTACE F. WALLIS, Newton, near Kettering: *January 12th, 1919.*

Societies.

YORKSHIRE NATURALISTS' UNION: ENTOMOLOGICAL SECTION. ANNUAL MEETINGS.—These were held, by kind permission of the York Philosophical Society, in the library of the Museum at York, on Saturday, October 26th, 1918, under the presidency of Mr. G. T. PORRITT, F.L.S., F.E.S. The difficulties of present-day travelling probably accounted for the small attendance, though many leading Yorkshire entomologists were present.

The afternoon meeting was held at 3.15 p.m., for the election of officers for the ensuing year and for the exhibition of specimens.

Before the ordinary business of the meeting, Mr. Porritt asked the members present to pass a vote of condolence and sympathy with Dr. Corbett and his family on the death of his only son, Capt. H. V. Corbett, an enthusiastic and able naturalist, who was killed in action on October 17th. This was silently passed, the members standing in their places.

The report, as read by Mr. B. Morley, one of the secretaries, showed that notwithstanding difficulties owing to war conditions much good work had been done, especially among the *Coleoptera* and *Hymenoptera*, of which particulars of the more interesting species are given later in the list of exhibits. In the "neglected" orders some 70 species had been added to the county lists.

In *Lepidoptera* Mr. J. H. Hooper had taken a specimen of *Argynnis paphia* in Deffler Wood in the Huddersfield district, a species of great rarity in West Yorkshire. Mr. Rosse Butterfield had captured *Argynnis euphrosyne*, along with *Coremia munitata* at Barden-in-Wharfedale: Mr. W. Fabian reported *Sphinx ligustri* from York, and from the same place *Vanessa antiopa* and *Choerocampa elpenor* were recorded by Mr. E. H. Tye. Mr. Arthur Smith reported *Sesia caliciformis*, *Epione paradicaria* (plentiful), and *Cosmia paleacea* from Sandburn, York, and *Dicranura bifida* and *Collic sparsata* from Askham Bogs. *Pinsia moneta* was recorded as having been common at York and Hull by Mr. W. Hewett and Mr. J. Porter respectively: also a single specimen of the species at Huddersfield by Mr. Ellis. *Rumicia phlaeas* had abounded in many parts of the county, and in many unusual places. Mr. Porritt had collected two large broods of larvae of *Cucullia verbasci* at Huddersfield, a species hitherto never noticed in the district. Mr. J. W. Carter had found a brood of the same species in the public park at Bradford, where also it was a great rarity. *Sphinx convolvuli* had occurred at Skelmanthorpe to Mr. T. H. Fisher.

Among *Microlepidoptera* Mr. T. A. Lofthouse had taken *Peronea mixtana* and *Phoxopteryx unguicella* on the Cleveland Hills; *Sciaephila sinuana* had occurred freely in various woods in the Huddersfield district to Mr. Porritt and Mr. Morley, and the latter had also taken *Cerostoma sequella* (in great abundance on sycamore trunks), *Stigmota regiana* and *Amphysa gerningana* at Skelmanthorpe. *Elachista kilianella* was common on Eston moors. In the early summer larvae of the "winter moths" *Phigalia pilosaria*, *Hybernia defoliaria*, *H. aurantiaria*, and *Cheimatobia brumata* had been exceptionally abundant, the last mentioned having completely defoliated apple-trees in some gardens, while those of *Tortrix viridana* had done the same with oaks in the woods.

In *Neuroptera* Mr. Porritt recorded *Coniopteryx aleurodiformis* as fairly common in two woods at Huddersfield, the species only having previously been recorded in the county from the Cleveland district. *Chrysopa tenella*, after an apparent scarcity for some years, had been abundant again at Huddersfield.

In *Hymenoptera* Mr. J. F. Musham recorded *Prosopis hyalinata* and many other species from Selby; and Mr. R. Butterfield had found numerous nests of *Myrmica rubra* race *lobicornis* at Grassington and Keighley, and *Formicovenus nitidulus* in nests of *Formica rufa* near Ilkley Bridge. Also *Sphecodes pilifrons*, *S. variegatus*, and *S. hyalinatus* at Keighley.

In *Diptera* Mr. Butterfield reported *Microdon mutabilis* and *Ceratopogon myrmecophilus* from pupae found in nests of *Formica fusca* at Grassington.

The election of officers for 1919 resulted in the retention of Mr. Porritt as President and the re-election of all other officers and Committees.

The exhibits showed a tendency towards a further interest among Yorkshire entomologists in the "neglected orders" than has heretofore been the case. This is a very welcome state of affairs, as the distribution of the species of many orders is still little known. Among the more interesting insects shown were:—

Coleoptera.—Mr. M. L. Thompson showed *Demetrias atricapillus* L., Sandsend, July 1918; *Tachinus proximus* Kr., Thornton Dale, Sept. 1918; *Lathrobium multipunctatum* Grav., Sandsend, July 1918; *L. geminum* Kr., Barnard Castle, May 1918; *Trogophloeus elongatus* Er., Barnard Castle, Oct. 1918; *Rhizophagus ferrugineus* Payk., Kildale, May 1918; *Laria rufimana* Boh., Kildale, May 1918; *Trachypiloeus biforeolatus* Beck., Sandsend, July 1918; *Pissodes notatus* F., Kildale, May 1918; *Magdalalis armigera* Fourer., Barnard Castle, May 1918; *M. pruni* L., Ingleby-in-Cleveland, June 1918; *Hylastes ater* Payk., Barnard Castle, May 1918. Dr. Fordham showed *Bembidion doris* Panz. and *Molorchus minor* L., taken at Bubwith, both new to Yorkshire; *Clytus mysticus* L., new to East Yorkshire; and *Dytiscus circumcinctus* Ahr., captured in a water-tub. Mr. Hearst showed *Acanthocinus aedilis* L., taken at York.

Hymenoptera.—Dr Fordham showed many new county records, of which a list will appear shortly in "The Naturalist," and also a remarkably small ♀ *Sirex noctilio* F. and a specimen of *Sirex cyaneus* from Micklefield Colliery. An association of species from Skipwith Common—*Andrena albicans*, *A. gwynnana* Nomada succincta, *N. bifida*, *Sphecodes pilifrons*, *S. ferruginatus*, and *Hydrolaena dentipes*; *Spathus exrator*, a Braconid new to Yorkshire, ex *Caryntes coeruleus*; and the Aculeates, *Osmia auriventris* Panz., *O. leiana* Kirb., *Colletes succinctus* L. and *Diodontus luperus* Shuck., all from Bubwith; 32 species of Ichneumonidae, nearly all new to the county, including the rare *Melanichneumon faunus*, *Ichnenon gradarius*, and *Polysphincta gracilis*, all from the Bubwith district; *Hemiteles cingulata* and *Clistopyga circulator*, both new to the county, from Saxton; 15 species of Sawflies, new to the county.

Diptera.—A *Phora* ex *Mysia oblitterata* and *Echinomyia grossa* ex *Lasiocampa rubi*.

Dr. Corbett showed, from the Doncaster district, a number of Sawflies and Ichneumons, etc., among which the following were new county records:—*Tenthredopsis tiliæ* and *dorsata*, *Pachynematus flaviventris*, *Dolcetus haematodes*, *Cephus pallipes*, *Notocnus panzeri*. Also a collection of 31 species of *Aculeata*, all taken during the past season in a sand-pit near Doncaster, and among which *Colletes perdixus*, *Andrena denticulata*, and *Panurgus ursinus* were new to the county.

Lepidoptera.—Mr. Porritt showed *Abraxas geosamniata*, vars. *nigra*, *nigrosparsata*, and *variegata-nigrosparsata*, mostly from wild larvae at Huddersfield in 1918.

Mr. Hewett showed a series of *Arctia caja* with only slight variation. These were the only aberrations from about 500 larvae.

Mr. Morley showed *Crambus pinellus*, *Sciaphila sinuana*, and *Cerostoma sequella* from Skelmanthorpe.

At the evening meeting Dr. Corbett read a paper on the recent capture of *Trigonalyda hahnii* near Doncaster (see "Entomologist," Oct. 1918); and there was a long discussion on the causes and modes of determination of sexual attractions in Lepidoptera by Messrs. Wm. Hewitt, B. Morley, and S. Walker.
—H. H. CORBETT, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
October 24th, 1918.—The President in the Chair.

The decease of Lieut. J. Bateson, who was killed in France, was announced.

Mr. Bowman exhibited a nearly jet-black *Cymatophora ocellaris* from Chingford. Mr. W. J. Ashdown, *Geotrupes pyrenaeus* from Surrey, with a fine bronze-tinted aberration. Mr. Curwen, the "Book of Beautiful Butterflies." Rev. G. Wheeler, Rev. A. T. Stiff, Mr. Sperring, Mr. Buckstone, Mr. Leeds, Mr. Frohawk, Mr. Turner, etc., series of *Epinephele tithonus*. Mr. Wheeler read a paper: "The Variation in *Epinephele tithonus*."

November 28th, 1918.—The President in the Chair.

Messrs. E. W. Nimmey, F.E.S., of Watford, and D. C. Johnstone, of Rayleigh, were elected Members.

ANNUAL EXHIBITION.—Mr. W. G. Sheldon exhibited a very long series of *Sarrothripus revayana* (*undulana*), including the forms *ramosana*, *stonana*, *dilutana*, *fusculana*, *ilicana*, *afzeliana*, *tathamiana*, *undulana*, *bifasciana*, etc. Mr. W. J. Lucas, an album of photographs of well-known entomologists in the field. Mr. R. South, three aberrations of *Brethis selene*, for Mr. Penn of Brighton. Mr. South also showed variations of *Epinephele jurtina* and *Tricopteryx polymicta* for Mr. L. Meaden, besides various species of *Coleoptera*. Mr. W. J. Lucas, five species of *Nemopteridae* (*Neuroptera*) from the S.E. Mediterranean district, including *Nemoptera simula*, *N. bipennis*, *N. coa*, *Lertha barbara*, and *Haltera pallida*. Mr. Hy. J. Turner, series of (1) *Euchloë cardamines*, race *turritis*, from Cyprus, with ♂ and ♀ examples of the very small ab. *minor*;

(2) *Parnassius apollo*, race *pumilus*, from the Calabrian Mts., S. Italy, a very local and small race; (3) *Colias edusa*, the clear yellow form ab. *helicina* from Cyprus, and ab. *helice*, one with orange hind-wings; (4) *Satyrus briseis*, race *fergana*, from Cyprus, with the ab. *pirata*, together with a very small male from Nen Spalding; (5) *Satyrus p愧uri* from Spain, a species similar to the last with its parallel ab. *uhagonis*; (6) *Agriades coridon*, the single-brooded species from near Florence, with ab. *albo-lunata*; (7) *A. aragonensis*, the double-brooded species from the same ground; (8) *Plebeius aegon*, race *masseyi*, ♂ and ♀, from Witherslack; (9) *Coenonympha tithon*, race *philoxenus*, from Witherslack; (10) *Notodonta ziczac*, a second brood specimen bred at Redhill, July 31st, 1918; (11) *Agriades coridon*, ab. *semisyngrapha* and ab. *roystonensis* from Royston, ab. *per-aurantia* and ab. *irregularis-obsoleta* from Reigate; (12) *Salebria semirubella* (*carnella*) from Box Hill, with ab. *sanguinella*; (13) examples of *Danaida plexippus* (Asia) and *D. archippus* (America), and called attention to the absolute confusion for the past 150 years in the application of these two names, etc. Mr. J. H. Carpenter, aberrations of undersides of *Agriades coridon*, including many named forms. Mr. L. W. Newman, (1) long series of the Irish form of *Melitaea aurinia* from Tyrone larvae; (2) curious *Aglais urticae* and *Argynnис cydippe* (*adippe*); (3) aberrations with bleached forms of *Triphaena janthina*; (4) a gynandromorph of *Dryas paphia*, 3 wings = *ralezina* 1 wing partly ♂ *paphia*; (5) a yellow *Aglais urticae*, bred; (6) long varied series of *A. coridon*, *C. pamphilus*, and *R. phlaeas*—(4), (5), and (6) were on behalf of Mr. Percy Richards. Mr. R. Adkin, (1) *Argynnис paphia*, a remarkable aberration; (2) *Peronea variegana*, a bred varied series. Mr. L. W. Newman, for Mr. Oliver, aberrations of (1) *A. urticae*, from ab. *alba* to ab. *salmonicolor*, with ab. *ichansa*; (2) *Epinephele jurtina*; (3) *Ruralis betulae*, ♀ without the white line underside; (4) *Argynnис aglaia* bleached, and ab. *belisaria*; (5) *A. coridon*, ♂ ♂, grey, blue, and green forms, and many striking varieties; (6) *Aricia medon*, yellow spotted; (7) *Celastrina argiolus*, true halved gynandromorph (Sutton Park), etc. Mr. Newman, for Mr. Sabine, a large collection of *Noctuae* (Ireland, 1918), with a number of racial series and individual aberrations. Mr. C. H. Williams, aberrations of *A. coridon*, including ab. *albina*, ab. *syngrapha*, ab. *marginata*, etc. Mr. B. W. Adkin, long series to illustrate the variation in (1) *A. paphia*; (2) *Eugonia polychloros*. Mr. Stanley Edwards, sections of the genus *Euploea* from India and the Malayan Isls. Mr. H. A. Leeds, a number of individual aberrations of *Pararge aegeria*, *E. jurtina*, *E. titonus*, *Aphantopus hyperantus*, *C. pamphilus*, *A. thetis*, *Polyommatus icarus* (8 phases), *Agriades coridon* (19 phases), *Aricia medon*, *Strymon pruni*, and *Bithys quercus*. Mr. R. Bowman, *Numeria pulveraria*, 2nd brood, August 1918, with much deeper markings than usual; and *Rumicia phlaeas*, ab. *eleus*, Horsley, August 1918. For Mr. Ing, he showed *Arctia caja*, a varied bred series. Mr. F. W. Frohawk, (1) *Brenthis euphrosyne*, showing variation in coalescence of spotting; (2) *Euchloë cardamines*, variation in colour and size of apical and discoidal markings, etc.; (3) *Chrysophanus dispar*, ♂, symmetrically white-marked wings, bred by Doubleday; (4) two *Issoria lathonia*, Colchester, 1818. Rev. G. Wheeler, *Pararge megaera*, ♀, ab. *mediolugens*, near Guildford, 1918; and *Rumicia phlaeas*, ab. *suffusa*, ab. *caeruleo-punctata*, and ab. *intermedia*. Mr. Riches, a series of aberrations of *Abraxas grossulariata* from N. London.

Mr. A. A. Buckstone, (1) *Hygrochroa syringaria*, bred series of specimens with abnormal wings. Mr. H. Moore, *Anosia archippus*, racial forms from areas ranging from Canada to the Argentine. Rev. J. S. Tarbat, for Mr. Burras, (1) *Dryas paphia*, much coalesced and suffused examples; (2) *A. cydippe* (pale); (3) *Phragmatobia fuliginosa* (yellow); (4) *Lithosia deplana* (very dark); (5) *Calymnia trapezina* (extremes of aberration). Rev. A. T. Stiff, (1) *Amorpha populi*, buff and pink form; (2) *Saturnia pavonia*, with pink marginal band on hind wings; (3) *Arctia villica*, ♀, with confluent spots and hind wings almost devoid of markings; (4) *Arctia caja*, ♂ salmon-pink, ♂ yellow, ♂ pink-yellow and confluent spots, several with dark fore wings; (5) *C. pamphilus*, with extra ocelli below, etc. Mr. Ashdown, long series of aberrations of *Adalia bipunctata* (Coleopt.). Dr. T. A. Chapman, *Orgyia vetusta*, California, a long, variable, bred series, with *O. antiqua*, *O. splendida*, and *O. aurolimbata* for comparison. Mr. G. Fryer, *Scodionus sagaria* (*belygaria*), a melanic example; and *Polyommatus icarus*, a striated form. Captain B. S. Curwen, a number of species of British Fossiliferous *Hymenoptera*, including the rare *Methoca ichneumonides*. Mr. W. West, for the Society, the Collection of Canadian Lepidoptera. Mr. L. Tatchell, (1) *Dryas paphia*, with heavy markings; (2) *E. polychloros*, with light underside; (3) *A. urticae*, ab. *polaris*, bred; (4) *Agriopis apricina*, typical, melanic, and ab. *virgata*; the exotic Pierid *Hebomoia glaucippe*, India, with races *australis* (S. India), *sumatrana*, *celebensis*, and *javanensis*. Mr. A. W. Buckstone, for Mr. Pugsley, *Plutella cruciferarum*, bred, from wild seakale. Mr. A. Butterfield, *Teracolus evanthe*, Madagascar, three forms of the ♀, the ♂ and a rare aberration of the ♂ with apical blotch clear lemon-yellow. Mr. W. J. Kaye, a very fine graduated series of *Heliconius melpomene*, to show the range of the lines of variation, local, aberrational, and developmental, illustrated by the named forms.

December 12th, 1918.—The President in the Chair.

Mr. Ashdown exhibited Neuroptera from the late Mr. C. A. Briggs's collection, including *Perla maxima*, *P. cephalotes*, *Chloroperla grammatica*, *Nemoura variegata*, *Isopteryx tripunctata*, etc., and presented them to the Society's cabinets. He also showed various species of the Coleoptera taken by him in Surrey in 1918. Mr. R. Adkin, several species of Tortrices, bred from larvae feeding on ivy along the parades at Eastbourne, *T. forsterana*, *C. podana*, and *T. pronubana*. Mr. R. Bowman, a *Tephrosia bistortata* with dark suffused marginal area. Mr. Barnett, a very variable series of *Bryophila perla* from Warrington. Mr. B. W. Adkin, *Dryas paphia*, showing aberration in coloration, marking, size, and shape of wing. Mr. W. West, the rare Coleopteron *Amarocharu bonnairei* from Box Hill, not taken since 1863 by Dr. Power. Mr. H. J. Turner, a long series of the Lycaenid *Chilades trochilus* from Cyprus, one of the smallest species of Rhopalocera; also a series of *Hydroecia crinanensis* from Ireland, with several of the named forms sent him by Mr. Greer. Mr. A. A. W. Buckstone, several series of *Agriades coridon*, and contributed a note on the dwarf local race taken on the N. Downs during the past two years. Several members gave notes on the season. *Hibernia defoliaria* had been seen as early as September 23rd in Surrey.—*Hv. J. TURNER, Hon. Editor of Proceedings.*

ENTOMOLOGICAL SOCIETY OF LONDON: Wednesday, October 2nd, 1918,
Dr. C. J. GAHAN, M.A., President, in the Chair.

Dr. Chapman exhibited a bred specimen of *Lycaena alcon*, probably the first example that has been bred, certainly the first from larvae taken in the autumn, and made observations on its life-history. Mr. Donisthorpe, a specimen of the common Cockroach (*Blatta orientalis*) taken under bark of oak in the New Forest, far away from any houses, July 29th, 1918. Also a curious ergatandromorph of *Myrmica sulcinodis* taken on Bloxworth Heath, from the collection of the late Rev. O. Pickard-Cambridge. Mr. Hugh Main, the three larval skins of *Dytiscus marginalis*, prepared for demonstration purposes.

The following paper was read, the author illustrating his subject with photographs shown in the epidiascope:—"Notes on Australian Sawflies, especially 'Authors' Types' and the Specimens in the British Museum of Natural History and the Hope Collection in the Oxford University Museum, with Diagnostic Synopses of the Genera and Species," by the Rev. F. D. Morice, M.A., F.E.S.

Wednesday, October 16th, 1918.—Dr. S. A. NEAVE, M.A., F.Z.S., Vice-President, in the Chair.

Mr. E. E. Green exhibited specimens of a rare Coccid (*Kermes quercus*) taken on the stem of a single oak, at Selby (Yorkshire); the species had been seen on two or three occasions only, apparently in the London district; they were found to be associated with dense groups of adventitious buds on the stems of the tree, and were extraordinarily like the buds themselves. Mr. W. G. Sheldon, specimens of *Eupithecia helveticata*, var. *arcuathata* Frey, and a living larva from Surrey, and made observations thereon. Mr. W. J. Kaye, a remarkable new form of *Heliconius erato*, for which he proposed the name *extrema*; it formed a connecting-link between *H. erato chestertoni* and *H. erato colombiana*. Mr. Hugh Main, as transparencies in the epidiascope, the larval skins of *Dytiscus marginalis*, which had been handed round at the meeting on October 2nd.

Wednesday, November 6th, 1918.—The President in the Chair.

SPECIAL MEETING.—The Treasurer formally proposed to delete Clause 5 of Ch. viii, and to substitute: "The Council shall nominate a chartered or incorporated Accountant annually, who shall audit the Treasurer's accounts. The Auditor shall be paid for his services a fee, the amount of which shall be agreed by the Council on behalf of the Society. The Treasurer shall furnish the Accountant with all the facilities he may require for auditing the accounts." The Treasurer having fully explained his reasons for proposing this alteration, it was seconded by Dr. Chapman and carried *nem. con.*

ORDINARY MEETING.—The Rev. Fr. O'Neil, S.J., Salisbury, Rhodesia; Messrs. Ernest William Nimmy, 210 Whippendell Road, Watford, Herts; R. Stanway Parris, 6 High Street, Bishop's Stortford; the Rev. Alfred T. Stiff, Grantham, Victor Drive, Leigh-on-Sea; Capt. William Henry Tapp, F.R.A.S., F.R.G.S., and Mrs. Eleanor Eva Tapp, of Loos, 88 Wickham Way.

Beckenham, Kent; and the Rev. E. Adrian Woodruffe-Peacock, F.L.S., F.G.S., Cadney Vicarage, Brigg, Lincolnshire, were elected Fellows of the Society.

Mr. Lucas exhibited *Orthoptera* from Salonica, sent by Mr. P. J. Barraud, and made observations on them. Captain Burr, a series of *Orthoptera* from Macedonia. Dr. F. A. Dixey, males and females of *Glutophrissa epaphia* and *Pinaeopteryx sabina*, with outline drawings of their scent-scales. Mr. H. Dollman, two series of some thirty specimens each of bred *Charaxes*: they represented two distinct species of the "ethocodes" group, the one having the ♀ form of *mania* Trimen (resembling small ♀ *bohemani*), the other having the ♀ form of *phacus* Hew. (resembling small ♂ *bohemani*). Lord Rothschild, a series of a local race of *Precis octavia* from Tembora, Bahr-el-Gazal, and drew attention to the extraordinary number of intermediate specimens among the series of the dry-season form—14 out of 16. Also a series of wet- and dry-season forms with intermediates of *Precis octavia octavia* Cram. and *Precis octavia sesamus* Trimen, from West and South Africa respectively, for comparison.

The following paper was read:—"Butterfly Vision," by H. Eltringham, M.A., D.Sc., F.E.S. This was illustrated by the author by means of the epidiascope with drawings and photographs showing the way in which images of surrounding objects were presented to the view of insects, and also illustrating experiments on the colour-perception of butterflies, from which it seemed certain that colours appear to them as they do to us.

Wednesday, November 20th, 1918.—The President in the Chair.

Mr. Joseph Herrod-Hempshall, Orchard House, Stockingstone Road, Round Green, Luton, Beds, was elected a Fellow of the Society.

The following list of Fellows nominated by the Council to hold office during the ensuing year was read:—*President*, Comm. James J. Walker, M.A., R.N., F.L.S. *Treasurer*, W. G. Sheldon. *Secretaries*, Rev. George Wheeler, M.A., F.Z.S.; Dr. S. A. Neave, M.A., F.Z.S. *Librarian*, George Charles Champion, F.Z.S., A.L.S. *Other Members of Council*, E. C. Bedwell; G. T. Bethune-Baker, F.L.S., F.Z.S.; Kenneth G. Blair, B.Sc.; Malcolm Cameron, M.B., R.N.; W. C. Crawley, B.A.; J. Hartley Durrant; Dr. H. Eltringham, M.A., F.Z.S.; Dr. C. J. Gahan, M.A.; Dr. A. D. Immis, B.A., F.L.S.; Dr. G. A. K. Marshall, F.Z.S.; Rev. F. D. Morice, M.A.; Herbert E. Page.

Mr. Arthur Dicksee exhibited three specimens of a new race of *Morpho eugenia* from Colombia, from which it was hitherto unknown, together with two *Morpho eugenia* from French Guiana, and one *Morpho adonis* from French Guinea, and another from the Lower Amazons, for comparison. Capt. Purefoy, a score of home-bred *Lycaena arion*, together with their pupa cases. Mr. W. J. Kaye, six female *Mechanitis polymnia* from the Berbice River, caught at Friendship in July 1914 by Mr. H. C. Patoir, which all showed a very considerable darkening of the outer half of the hind wing, one in particular having the whole outer half black.

The following paper was read:—"The Hymenoptera of Fiji," by Rowland E. Turner, F.E.S.

Wednesday, December 4th, 1918.—The President in the Chair.

Messrs. Anderson Fergusson, 22 Polworth Gardens, Glasgow, W.; George Grace, B.Sc., A.R.C.Sc., Inglenook, Utley, Keighley, Yorks, and P. V. Isaacs, B.A., Assistant Entomologist to the Madras Agricultural College and Research Institute, Coimbatore, India, were elected Fellows of the Society.

Mr. W. J. Lucas exhibited *Neuroptera* from Salonica, sent to him by Mr. P. J. Barraud in 1916–1918. Prof. Poulton gave an account of the deeply interesting observations made at Tanga, late German East Africa, on August 5th, 1918, by Mr. W. A. Lamborn, on the relation of the anal tufts to the brands of the hind wings observed and the scent perceived in a male Danaine butterfly, in continuation of his S. Nigerian investigations and those of Capt. Carpenter. He also said that he had received notes from Mr. C. B. Williams, who had written from the Department of Agriculture, Trinidad, B.W.I., giving a suggested interpretation of the special attacks made by blood-sucking *Diptera* on new-comers into the Tropics and of their gradual diminution. The President exhibited a Chaleid, *Torymus elegans* Borkh., sent to him by the Rev. E. A. Woodruffe-Peacock, which had emerged from a rosaceous seed which had passed through the alimentary canal of a blackbird, together with the seed from which it had appeared. Mr. L. B. Prout, on behalf of Mr. J. J. Joicey, species of the genus *Castnia* and a mimetic Hesperiid, including several new or doubtful forms of *Castnia*, not yet fully worked out.

The following paper was read:—"Notes on a large Heliconine Collection made in French Guiana in 1917, compared with a similar Collection made in 1915." by J. J. Joicey, F.E.S., and W. J. Kaye, F.E.S.—GEO. WHEELER,
Hon. Secretary.

THE GENUS *DIANOUS* SAMOUELLE, AS REPRESENTED IN INDIA AND
CHINA [COLEOPTERA].

BY G. C. CHAMPION, F.Z.S.

Early last year my eldest son, H. G. C., sent me a tube containing a very large number of unmounted *Dianous*, representing nine or ten species, from W. Almora, Northern India. Subsequently, at my request, he has obtained, with the assistance of a native collector, still further material, including several additional species, and more examples of some of the others of which one or two only had been found in the first consignment. The extraordinary development of this Staphylinid-genus in a limited region on the southern slope of the Himalayas is very remarkable, showing how little we know about the actual number of existing species of at least one well-known genus of Coleoptera. The total number of described *Dianous* from the whole world, so far as can be ascertained at the present moment, is six—one holarctic, one from N. America, three from Sikkim (all represented in the series before me), and one from Burma. The Almora material includes sixteen species, one only of which is based on a single example, the others being mostly

in long series, two, for some unaccountable reason, in far greater numbers than the rest. My son notes that "the proper home of these Indian insects is undoubtedly about the headwaters of the mountain-streams, where the volume of water is less and the fall steeper, so that the spray is sprinkled over the mossy boulders on which the *Dianous* are to be found, at elevations between 6000 and 9000 feet, stray specimens only occurring lower down the streams." *Dianous* is evidently far better represented than *Stenus* in the hilly regions of Northern India, comparatively few species of the latter genus, and these mostly in very limited numbers, having been obtained as yet in Almora; but this may be due to the fact that very few *Steni* are found about running water, at least in Europe, *S. guynemeri* Jacq. Duv. (a very rugose insect, not unlike some of the Indian *Dianous*) and *S. guttula* Müll. being, perhaps, the best known examples.

The specimens sent (upwards of 500 in all), with the exception of one or two of each species mounted in India, were all forwarded in glass tubes, in diluted spirit, and they arrived in perfect safety. Those taken from the tubes were in excellent condition for mounting and immediate study, many of the males having the genital armature extruded, so that this portion of their structure could be seen in a number of the species without dissection. The armature of the nine examined affords four types of aedeagus or median lobe (simply pointed in six of the species, and broad to the apex and otherwise shaped in each of the remaining three) and less marked differences in the form of the very long, slender, ciliate lateral lobes.

I am indebted to Mr. H. E. Andrewes and Fleet-Surgeon M. Cameron for the loan of the types and co-types of *D. andrewesi* and *D. versicolor*. The types of the others here described will be placed in the British Museum, which has not hitherto possessed a single representative of the genus *Dianous* from India. The dates of capture quoted have been taken from the mounted set, no record having been kept by me for the remainder.

The opportunity is here taken of inserting at the end of this paper a description of a new species of the same genus from Che-kiang China.

Table of the N. Indian Species of Dianous.

Elytra densely, very finely, uniformly punctured, alutaceous, the vestiture somewhat variegate, tending to form spots or sinuous fasciae on disc.

Prothorax quadridinodose, deeply excavate laterally, the convex portion of the disc shining, sparsely, minutely punctured; upper surface of body greenish or brassy.

- Fourth tarsal joint unilobed and penicillate at tip; elytral depressions deep *versicolor* Cam.
 Fourth tarsal joint simply penicillate at tip; elytral depressions shallow. *annandalei* Bernh.
- Prothorax at most binodose near base, more closely and more coarsely punctured.
 Elytral depressions deep; upper surface of body bluish-black. *inaequalis*, n. sp.
 Elytral depressions shallow.
 Upper surface shining, brassy or golden, head blue, elytra caeruleo-fasciate *caerulconotatus*, n. sp.
 Upper surface dull, greenish; prothorax densely scabroso-punctate. *scabricollis*, n. sp.
 Upper surface dull, leaden-black; ventral segments cyaneous, with smooth median space *cyanogaster*, n. sp.
 Upper surface more shining, bluish-black; ventral segments cyaneous, uniformly punctate *punctiventris*, n. sp.
- Elytra more coarsely punctured, in part vorticose; upper surface black or brassy (head and prothorax cyaneous in *lobigerus*, var.).
 Fourth tarsal joint with long, narrow lobes; antennae very elongate. *lobigerus*, n. sp.
- Fourth tarsal joint with short, narrow lobes.
 Elytra with a small dull luteous spot *distigma*, n. sp.*
 Elytra immaculate *cameroni*, n. sp.
- Fourth tarsal joint simply excavate at tip above, that of the anterior and intermediate pairs tending to become sub-bilobed.
 Tarsi very long and slender; elytra densely sculptured; upper surface metallic *andrewesi* Cam.
 Tarsi shorter and less slender.
 Elytra coarsely vorticose; head broad; eyes large; upper surface shining, usually black *radiatus*, n. sp.
 Elytra more finely vorticose.
 Species larger.
 Prothorax somewhat coarsely, irregularly punctured; upper surface shining *tortuosus*, n. sp.
 Prothorax finely, densely punctured; upper surface duller. *subvorticinus*, n. sp.
- Species smaller, with brassy upper surface; head rather small.
 Antennae elongate *aereus*, n. sp.
 Antennae comparatively short *minor*, n. sp.

1.—*Dianous versicolor*.

Dianous versicolor Cameron, Trans. Ent. Soc. Lond. 1913, p. 533.

Hab. INDIA, Lebong in Sikkim, alt. 5000 ft. (*type*, ♂, in coll. Cameron), W. Almora (H. G. C.: vi.1918: ♂).

* *D. vorticinus* Epp., from Burma, must be allied to *D. distigma*: it is nigro-cyaneous in colour, with a shining, rounded, reddish spot on each elytron.

A male from Almora, agreeing with the type, except in the greener, non-violaceous colour of the upper surface. The following characters, taken from the two specimens before me, supplement the author's description:—Fourth tarsal joint produced beneath the fifth into a single narrow lobe (formed by a prolongation of the outer portion of the emarginate apex), which is clothed at the tip with a pencil of long hairs, the latter reaching nearly as far as the apex of the terminal joint; ventral abdominal segments 1–3 with an almost smooth glabrous space down the middle; dorsal segment 6 with some rather coarse scattered punctures. The almost smooth, shining, quadrigonose, obliquely latero-excavate, basally subearinate prothorax, and the four rather deep excavations on each elytron, are conspicuous characters. The seventh abdominal segment, from a plate at the sides of which the long anal brushes* arise, is withdrawn into the sixth in the type, the "last ventral" of Cameron's description being the penultimate. *D. versicolor* is extremely like the insect identified by me as *D. annandalei* Bernh., and the differences are noted in the remarks on that species.

2.—*Dianous annandalei*.

Dianous annandalei Bernh. Ent. Blatt. vii, p. 57 (1913).

Obscure greenish-aeneous, the antennae and palpi black; alutaceous, the prothorax much smoother and shining; thickly clothed (the prothorax excepted) with very fine adpressed pubescence, which is cinereous on the legs and under surface, and variegated on the elytra, showing a tendency to form three cinereous spots across the middle of the disc. Head broad, very densely, minutely punctate, the intra-ocular depressions shallow, foveiform, and somewhat widely separated; eyes moderately large; antennae long. Prothorax about as long as broad, rather narrow, arcuately dilated at the sides anteriorly, and constricted before the base, the hind angles somewhat prominent; carinate, rugosely punctate, and depressed at the base; very deeply, obliquely, angulato-excavate on each side a little behind the middle—the excavation limited anteriorly and posteriorly by a smooth, conspicuous, tuberculiform prominence, —and also deeply, obliquely grooved laterally before the basal margin; the convex portion of the disc sparsely, minutely punctate. Elytra subquadrate, wider than the head, nearly twice as long as the prothorax, and a little longer than broad; very densely, minutely punctate, shallowly, longitudinally depressed near the suture anteriorly and within the somewhat swollen humeri, the rest of the surface also uneven, two or three shallow depressions being visible in certain lights. Abdomen densely, minutely punctate, the last two segments with rather coarse scattered punctures; ventral segments 1–4 with a broad space down the middle, and the basal half of 6, smooth and glabrous, 5 and 6 with some yellowish hairs at the apex; anal brushes long. Fourth tarsal joint not lobed, but with a pencil of long hairs at the tip.

* Some authors use the term "anal style" for these appendages, which in *Dianous* are formed by a pencil of long matted hairs.

♂. Sixth ventral segment triangularly emarginate. Genital armature (fig. 1) : lateral lobes very long, slender, slightly sinuate, set with several long, projecting hairs on the inner edge towards the apex: median lobe drawn out into a long, slender point at the tip.

Length 8-8½ mm. (♂ ♀.)

Hab. INDIA, W. Almora (H. G. C.).

One pair, agreeing with Bernhauer's description of *D. annandalei* in the rugosely punctured, mesially carinate base of the prothorax and other particulars. His type, from Kurseong, was rather smaller (length 7 mm.). The peculiar sculpture of the prothorax, the shallower elytral depressions, and the simply excavate, non-lobate fourth tarsal joint, separate the insect before me from the very closely allied *D. versicolor* Cameron. A detailed description of the Almora specimens is given, as both authors have omitted to note the ventral and tarsal characters.

3.—*Dianous inaequalis*, n. sp.

Nigro-cyanous, the elytra and abdomen with a faint brassy suffusion, the palpi and antennae black; moderately shining, finely pubescent, the prothorax almost glabrous. Head broad, densely, very finely punctate, the intra-ocular grooves deep; eyes not very large; antennae long. Prothorax narrow, as long as broad, the sides rounded anteriorly and sinuously converging towards the base; closely, coarsely, irregularly punctate, the punctures sometimes absent along the centre posteriorly; deeply, obliquely sulcate, or angulato-excavate, on each side behind the middle, and also obliquely grooved laterally before the base, the submedian sulci more or less confluent on the disc, and the raised space in front of the latero-basal groove somewhat nodose at its inner extremity. Elytra wider than the head, longer than broad; alutaceous, densely, very finely punctate, strongly, irregularly plicate, the tumid portions of the surface more or less sinuous and separated by rather broad, depressed spaces. Abdomen closely, minutely punctate; ventral segments 1-4 and 6 with a polished glabrous space down the middle; anal brushes very long. Fourth tarsal joint without lobes.

♂. Sixth ventral segment triangularly emarginate.

Length 7-7½ mm.

Hab. INDIA, W. Almora (H. G. C.: vi.1918).

Three males. This insect has the elytra still more uneven than in *D. versicolor* Cameron, and the prothorax sculptured much as in *D. caeruleonotatus*, the general coloration being darker—nigro-cyanous with a faint brassy suffusion, except on the head.

4.—*Dianous caeruleonotatus*, n. sp.

Brassy, brassy-green, or golden, the head, a transverse or arcuate patch on the elytra just beyond the middle and a streak on the inflexed margin, the

apical dorsal segments of the abdomen, and under surface blue ; shining, very finely pubescent, the prothorax almost glabrous. Head moderately broad, transverse, densely, finely punctate, the intra-ocular grooves rather broad and deep ; eyes not very large ; antennae long. Prothorax narrow, about as long as broad, the sides rounded anteriorly and sinuously converging towards the base ; closely, rather coarsely punctate, the punctures becoming coarser behind, and sometimes wanting along a short, smooth median line at the base ; deeply, obliquely sulcate on each side behind the middle, the sulci confluent on the disc. Elytra as long as broad, wider than the head ; alutaceous, densely, finely punctate, excavate near the suture anteriorly and also within the tumid humeri, the area covered by the blue fascia also somewhat depressed. Abdomen closely, minutely, the penultimate dorsal segment a little more coarsely, punctate ; ventral segments 1-4 and 6 with a polished glabrous space down the middle ; anal brushes long. Fourth tarsal joint without lobes.

δ . Sixth ventral segment emarginate. Genital armature (fig. 2) : lateral lobes very long, slender, almost straight, set with a few projecting hairs on the inner edge at the tip ; median lobe pointed at the apex.

Length 6½-8½ mm. (δ ♀.)

Hab. INDIA, W. Almora (H. G. C.: iii.1918).

Thirty specimens. Separable from *D. versicolor* and *annandalei* by the less transverse, deeply bisulcate, blue head ; the rather coarsely punctured, non-nodose, less dilated prothorax ; the more shining, caeruleo-fasciate, more distinctly punctured elytra ; and the closer and finer puncturing of the penultimate dorsal abdominal segment. The median lobe of the δ aedeagus is less acuminate at the tip than in *D. annandalei*. The head is constantly blue, but the metallic coloration of the rest of the upper surface is somewhat variable in tint, the abdomen being sometimes greenish, or brassy with the transverse sulci blue.

5.—*Dianous scabricollis*, n. sp. *

Brassy or bronze-green above, blue beneath, the antennae and palpi black ; subopaque, alutaceous, clothed (the prothorax excepted) with fine pubescence, which is variegate on the elytra and condensed into two or three bluish or green patches across the middle of the disc ; densely, very finely punctate, the puncturing of the prothorax distinctly coarser and more rugose than that of the head or elytra, that of the sixth abdominal segment also rather coarse. Head broad, the intra-ocular grooves short, not very deep, distant ; eyes moderately large ; antennae long. Prothorax rather narrow, barely as long as broad, rounded at the sides anteriorly, constricted before the base ; with a deep oblique groove on each side of the disc. Elytra wider than the head, subquadrate, as long as broad ; longitudinally depressed along the suture anteriorly and also within the humeri. Ventral segments 1-3 with a narrow, almost impunctate, glabrous space down the middle. Tarsi slender, the fourth joint small, without lobes.

δ . Sixth ventral segment feebly triangularly emarginate, and the seventh truncate, at the apex. Anal brushes moderately long.

φ . Seventh ventral segment with two dentiform prominences in the centre at the tip. Anal brushes shorter, and composed of finer and fewer hairs,

Length 5-6 mm.

Hab. INDIA, W. Almora (*H. G. C.*: viii.1917 and vi.1918).

Seven specimens. Smaller and less shining than *D. caeruleonotatus*; the prothorax densely and much more finely punctured; the elytra sculptured and variegate much as in *D. annandalei*, the markings less distinct and the puncturing finer than in *D. caeruleonotatus*; the tarsi more slender. The three females, if their sex has been rightly identified by me without dissection, have shorter and more slender anal brushes than the males.

6.—*Dianous cyanogaster*, n. sp.

Robust, above subopaque, leaden-black, with a faint bluish lustre in certain lights, beneath brilliant cyaneous, the palpi and antennae black; densely, very finely punctate, the puncturing of the prothorax a little sparser on the middle of the disc; clothed (the prothorax included) with fine pubescence, which is in great part cinereous, giving a variegated appearance to the raised portions of the elytra. Head moderately broad, the intra-ocular grooves deep; eyes rather small; antennae not very long. Prothorax much narrower than the head, about as long as broad, arcuately dilated at the sides anteriorly and constricted before the base; with a deep oblique groove on each side of the disc behind the middle, bordered posteriorly by a conspicuous ridge—which appears nodose at its inner extremity as seen from above,—and a more or less distinct (rarely obsolete) fine median carina at the base. Elytra large, subquadrate, much wider than the head, about as long as broad; longitudinally depressed along the suture anteriorly and within the humeri, and with one or two other obliquely placed depressions on the apical half, the intervening spaces appearing sinuously swollen. Ventral segments 1-4 with a glabrous impunctate space down the middle; anal brushes long. Legs moderately long, not very slender, the tarsi comparatively stout, joint 4 without lobes.

δ . Fifth ventral segment feebly, and the sixth triangularly, emarginate, the fifth depressed in the middle behind. Genital armature (fig. 3): lateral lobes long, slender, compressed, slightly sinuate, set with several long hairs at the apex within; median lobe drawn out into a long point.

Length 7-8 mm. ($\delta \varphi$)

Hab. INDIA, W. Almora (*H. G. C.*: vi.1918).

Sixteen specimens. Distinguishable amongst the allied Indian forms by its robust build, comparatively short antennae and legs, dull leaden-black, densely, finely punctate upper surface, cinereo-variegated, uneven elytra, brilliant blue, unequally punctured ventral surface, etc. The genital armature is very like that of *D. caeruleonotatus*.

7.—*Dianous punctiventris*, n. sp.

Extremely like *D. cyanogaster*, nigro-cyanous above, cyaneous beneath; the upper surface more shining, the puncturing a little more diffuse, that of the prothorax much coarser and not so close, the ridge behind the oblique grooves on the latter less prominent; the elytra with a broad transverse depression behind the two longitudinal ones, the former bordered by a curved sinuous line of cinereous pubescence; the ventral surface closely, uniformly punctate.

δ . Fifth ventral segment depressed down the middle from a little below the base and triangularly emarginate at the apex, the sixth with a deeper triangular emargination.

Length $6\frac{1}{2}$ - $7\frac{1}{2}$ mm. ($\delta \varphi$.)

Hab. INDIA, W. Almora (H. G. C.: iv. 1918).

Five examples. Separable from both *D. cyanogaster* and *D. inaequalis* by the uniformly punctured ventral surface, there being no trace of an impunctate glabrous median area in *D. punctiventris*. The head and elytra are a little broader, the prothorax is more rounded at the sides anteriorly and less shining, the elytral depressions are shallower, and the antennae distinctly shorter, than in *D. inaequalis*.

8.—*Dianous lobigerus*, n. sp.

Aeneous or greenish-aeneous, the head, prothorax, abdomen, and under surface sometimes with a faint bluish suffusion, the antennae and palpi black; shining, sparsely, finely pubescent (the prothorax excepted). Head broad, densely, finely punctate, the intra-ocular grooves deep; eyes not very large; antennae extremely long, about reaching the middle of the elytra. Prothorax a little longer than broad, rounded at the sides, constricted before the base; densely, rather coarsely, irregularly punctate, the punctures obliquely or transversely confluent; sulcate for a short distance at the middle of the disc, and with an angular excavation on each side of this, and somewhat depressed at the base. Elytra wider than the head, longer than broad, rounded at the sides posteriorly; depressed along the suture anteriorly, within the humeri, and behind the middle; densely, rather coarsely, rugosely punctate, the punctures obliquely or sinuously confluent on the depressed area on the disc and transversely so near the basal portion of the suture, the tumid space exterior to this a little smoother than the adjacent surface. Abdomen densely, minutely, the penultimate dorsal segment more coarsely, punctate; ventral segments 1-3 with a bare, smooth space down the middle, 5 clothed with rather long yellowish hairs at the apex; anal brushes long. Fourth tarsal joint bilobed, the lobes long and narrow.

δ . Sixth ventral segment deeply, triangularly emarginate, the seventh sharply dentate at each outer angle. Genital armature (fig. 4): lateral lobes very long, slender, widened towards the apex, ciliate within; median lobe rapidly narrowed, pointed at tip.

Var. Cyaneous, the elytra brassy.

Length $6\frac{1}{2}$ - $7\frac{1}{2}$ mm. ($\delta \varphi$.)

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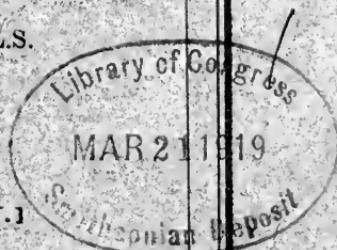
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MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—March 5th, 19th, April 2nd, 1919.

The Chair will be taken at 8 o'clock in the evening precisely.

The Library is open daily from 9 a.m. to 6 p.m. (except on Saturdays, when it is closed at 2 p.m.), and until 10 p.m. on Meeting nights.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge. The Second & Fourth Thursdays in each month, at 7 p.m. The lantern will be at the disposal of Members for the exhibition of slides.

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THE LONDON NATURAL HISTORY SOCIETY, which meets at 7 p.m. on the 1st and 3rd Tuesdays in each month, at Room 20, Salisbury House, Finsbury Circus, E.C., will be glad to welcome at its Meetings any French or Belgian entomologists now staying in this country, and to give them the benefit of its library and collections. Communications should be addressed to the Secretary, Salisbury House, E.C.

Hon. Sec.: J. Ross, 18, Queen's Grove Road, Chingford, N.E.

Chingford Branch. The Chingford Local Branch meets at the Avenue Café, opposite Chingford Station, at 8 p.m., on the 2nd Monday in each month.

Hab. INDIA, W. Almora (*H. G. C.*: vi.1918: ♂ ♀), Shillong in Assam (*E. W. C.*: var., ♂).

Six specimens, the ♂ from Assam differently coloured, but agreeing in other respects with those from Almora. Separable from *D. andrewesi* by the strongly bilobed fourth tarsal joint, the still longer antennae, the slightly smaller eyes, the rather coarser, less densely punctured prothorax, the more uneven, less rugose elytra, the peculiarly sculptured ventral surface, and the pronounced ♂-characters. The Assam example was sent me some years ago by my second son, who is also on Government service in India.

9.—*Dianous distigma*, n. sp.

Brassy-black above, steel-blue beneath, the elytra each with a very small, rounded, dull, luteous spot, the antennae and palpi black; shining, sparsely, finely pubescent. Head much wider than the prothorax, closely punctate, the intra-ocular grooves deep; eyes large; antennae long. Prothorax narrow, rounded at the sides, constricted posteriorly; densely, rather coarsely, irregularly punctate, sulcate down the middle towards the base, and with a deep oblique excavation on each side of this, and also obliquely grooved laterally in front of the basal margin. Elytra wider than the head, a little longer than broad, rounded at the sides posteriorly; depressed along the suture anteriorly, within the humeri, and behind the middle; coarsely, closely punctate, the punctures more or less confluent on the depressed portions of the surface, and separated by oblique or sinuous rugae. Abdomen closely, minutely punctate; ventral segments without definite impunctate median area, 5 with some yellowish hairs at the apex; anal brushes long. Legs not very slender; tarsi moderately elongate, somewhat thickened, the fourth joint narrowly, feebly bilobed.

♂. Sixth ventral segment triangularly emarginate. Genital armature (fig. 5): lateral lobes long, slender, almost straight, set with a few long, scattered, projecting hairs on their inner edge; median lobe sharply acuminate, curved downward at the tip, the produced apical portion ciliate laterally.

Length $5\frac{1}{2}$ - $6\frac{1}{4}$ mm. (♂ ♀.)

Hab. INDIA, W. Almora (*H. G. C.*: vi.1918).

Seventeen specimens. This insect has the prothorax and elytra sculptured much as in *D. cameroni*, differing from it in the less elongate legs, the relatively shorter and stouter tarsi, the spotted elytra, etc. The lobes of the fourth tarsal joint are shorter than in *D. lobigerus* and a little broader than in *D. cameroni*. The present species must be nearly related to *D. verticosus* Eppelsheim (1895), based on a single example from Pegu, Burma, which is said to be coloured like *D. coerulescens* Gyll., except that the shining reddish spot on the elytra is smaller and rounded.

10.—*Dianous cameroni*, n. sp.

Brassy-black, the femora and under surface more or less suffused with cyaneous, the antennae and palpi black; shining, sparsely, finely pubescent (the prothorax excepted). Head broad, densely punctate, the intra-ocular grooves deep; eyes large; antennæ very long. Prothorax narrow, a little longer than broad, constricted before the base; densely, rather coarsely, irregularly punctate, the punctures here and there obliquely confluent; sulcate for a short distance at the middle of the disc, and with an angular or oblique excavation on each side of this, and also obliquely sulcate laterally before the base. Elytra wider than the head, slightly longer than broad, rounded at the sides posteriorly; depressed along the suture anteriorly, within the humeri, and behind the middle; closely, coarsely punctate, the punctures on the apical half separated by sinuous or oblique, and those adjacent to the basal half of the suture by transverse, rugae. Abdomen closely, minutely punctate; ventral segments without definite impunctate median area; anal brushes slender, moderately long, consisting of very few hairs. Legs slender; tarsi elongate, narrow, the fourth joint bilobed, the lobes short and very narrow.

Length 6½-7 mm. (♂ ♀.)

Hab. INDIA, W. Almora (*H. G. C.*: iii. and vi.1918), Lebong in Sikkim (*in colls. Andrewes and Cameron*).

Six specimens seen (one now wanting the abdomen), including two referred by Cameron to *D. andrewesi*. The narrowly bilobed fourth tarsal joint, the sparser and coarser puncturing of the prothorax and elytra, the more coarsely punctate head, with sharply cut, deeper frontal sulci, and the less metallic, darker upper surface, distinguish *D. cameroni* from *D. andrewesi*, the latter being an extremely abundant insect in Almora.

11.—*Dianous andrewesi*.

Dianous andrewesi Cameron, Trans. Ent. Soc. Lond. 1913, p. 534 (part.).

♂. Sixth ventral segment deeply, triangularly emarginate,* seventh truncate at apex. Genital armature (fig. 6, dorsal aspect): lateral lobes long and slender to near the tip, and then curved and abruptly widened, the apical portion set with several long stiff hairs within; median lobe broadly rounded at the apex.

Hab. INDIA, W. Almora (*H. G. C.*: vi.1918), Lebong in Sikkim (*colls. Cameron and Andrewes*).

Found in profusion in Almora. Upwards of 200 examples are before me, showing scarcely any variation. *D. andrewesi* is distinguishable amongst the allied forms by its brassy, brassy-green, or

* Not visible in the Sikkim type, the penultimate of Cameron's description being the fifth visible segment.

cupreous-aeneous upper surface; the uneven, dense, vorticose sculpture of the prothorax and elytra, the interspaces between the punctures appearing scintillate in certain lights; the long, slender tarsi, without trace of lobes on the fourth joint; the rather broad frontal sulci; and the peculiar ♂ genital armature. The ventral surface of the abdomen is without definite glabrous median space. The darker examples mentioned by Cameron belong to another species, *D. cameroni*. The genital armature is extruded in many of the males sent in diluted spirit, and is therefore easily examined in such specimens.

12.—*Dianous radiatus*, n. sp.

Black, above and beneath, the upper surface with a more or less distinct brassy lustre; shining, the abdomen, legs, and under surface finely pubescent, the rest of the surface almost bare. Head broad, closely punctured, somewhat depressed and deeply bisulcate between the eyes, the latter large; antennae moderately long. Prothorax narrow, slightly longer than broad, the sides feebly rounded anteriorly and parallel at the base; coarsely, irregularly, confluent punctate, sulcate down the middle anteriorly, and with a deep, oblique, outwardly-expanded groove on each side, the latter coalescent inward with an indeterminate basal depression. Elytra somewhat convex, wider than the head, about as long as broad, rounded at the sides posteriorly; hollowed along the suture anteriorly and within the humeri, and also transversely depressed across the middle of the disc; coarsely, rugosely, confluent punctate, the prominent rugae between the punctures sinuously or obliquely radiating from the median depression. Abdomen minutely punctate, the ventral segments without smoother median space; anal brushes moderately long. Tarsi with the fourth tarsal joint deeply excavate at the apex above, that of the first and second pairs appearing sub-bilobed.

♂. Fifth ventral segment feebly emarginate, flattened in the middle posteriorly, the sixth deeply triangularly notched. Genital armature (fig. 7): lateral lobes very slender to beyond the middle, and then curved, dilated, and cultriform, the inner edge of this portion set with several long bristly hairs; median lobe drawn out into a slender acute point at the tip.

Length 6-7 mm. (♂ ♀.)

Hab. INDIA, W. Almora (*II. G. C.*: vi.1918).

Found in profusion, about 200 examples having been mounted for study, including many males with the genital armature exposed. Separable from all its allies by the shining black or brassy-black upper surface, the unusually large eyes, the coarsely punctured, uneven prothorax, the very coarse, vorticose, radiating sculpture of the elytra, and the peculiar ♂ armature. Four specimens have a stronger brassy lustre than the rest, showing a little variation in this respect.

13.—*Dianous tortuosus*, n. sp.

Black, with a brassy lustre in certain lights, the under surface obscure cyaneous; shining, very sparsely, finely pubescent. Head moderately broad, closely, rather coarsely punctate, the intra-ocular grooves deep; eyes not very large; antennae long. Prothorax narrow, about as long as broad, the sides rounded anteriorly and parallel at the base; closely, rather coarsely punctate, depressed and rugosely punctured posteriorly, grooved down the middle anteriorly, and with a very deep oblique sulcus on each side, the sulci extending inward to the basal depression, which is finely carinate in the centre. Elytra much wider than the head, subquadrate, rounded at the sides posteriorly, about as long as broad; coarsely, rugosely, confluent punctate, depressed along the suture anteriorly and within the humeri, and with a broad, transverse, submedian depression, the sculpture in these spaces strongly vorticose. Abdomen closely, minutely punctate, the sixth segment with coarser punctures; ventral segments uniformly punctured; anal brushes long. Legs moderately elongate, the tarsi not very slender, the fourth joint without definite lobes.

♂. Fifth ventral segment feebly, the sixth deeply, emarginate, the fifth depressed in the middle behind. Genital armature (fig. 8): lateral lobes long, slender, slightly sinuate, pilose towards the apex within; median lobe dilated and broadly bifurcate at the tip, the apex deeply emarginate.

Length 6–6½ mm. (♂ ♀.)

Hab. INDIA, W. Almora (*H. G. C.*).

Ten specimens. More rugose than *D. cameroni*, the legs shorter and not so slender, the antennae shorter, the elytral sculpture strongly vorticose, the fourth tarsal joint simply excavate at the apex, without definite narrow lobes. Compared with the abundant *D. radiatus*, the present species has the elytral sculpture less coarsely vorticose, the puncturing of the head and prothorax closer, the eyes not so large, and the ♂ armature very different.

14.—*Dianous subvorticosis*, n. sp.

Black, with brassy and bluish reflections in certain lights, the antennae and palpi black, the under surface nigro-cyaneous; moderately shining, finely pubescent, cinereo-variegate on the elytra. Head not very large, closely punctate, the intra-ocular grooves deep; eyes rather large; antennae moderately long. Prothorax much narrower than the head, about as broad as long, rounded at the sides anteriorly, constricted before the base; closely, rather finely punctate, with a deep oblique groove on each side of the disc and a short median sulcus between them. Elytra subquadrate, rounded at the sides posteriorly, much wider than the head, about as long as broad; densely, rather coarsely, rugosely punctate, longitudinally depressed near the suture anteriorly and within the humeri, with a transverse, rather broad excavation just behind the middle, the sculpture in this space and along the suture in front of it vorticose. Abdomen densely, minutely punctate; ventral segments uniformly punctured; anal brushes long. Legs moderately elongate, the tarsi comparatively stout.

♂. Sixth ventral segment deeply triangularly emarginate. Genital armature (fig. 9) : lateral lobes long, sinuate, compressed, curved inwards at the apex, and set with long hairs along the inner edge at and before the tip; median lobe dilated distally, the apex arcuato-emarginate in the centre, and angulate externally and on each side of the emargination.

Length 6-6½ mm. (♂ ♀.).

Hab. INDIA, W. Almora (*H. G. C.*: viii.1917).

Fifteen specimens. Smaller and less robust than *D. cyanogaster*, the upper surface more shining, the puncturing of the head, prothorax, and elytra coarser, distinctly vorticose in the depressed spaces on the wing-cases, the ventral segments without glabrous impunctate space, and the ♂ genital armature very different, the median lobe being dilated (instead of pointed) at the apex.

15.—*Dianous aereus*, n. sp.

Brassy above, the under surface and legs bluish, the antennae and palpi black; shining, very sparsely pubescent. Head a little wider than the prothorax, closely punctate, the intra-ocular grooves deep; eyes rather large; antennae very long. Prothorax slightly broader than long, rounded at the sides anteriorly, densely, roughly punctate, shallowly sulcate down the middle anteriorly, and with a deep oblique groove on each side of the disc. Elytra much wider than the head, a little longer than broad; depressed along the suture anteriorly, within the humeri, and across the middle; closely, coarsely punctate, the punctures more or less confluent, and separated by oblique radiating rugae on the depressed portion of the disc and by transverse rugae along the basal half of the suture. Abdomen densely, minutely punctate; anal brushes long, composed of numerous hairs. Legs long, not very slender; fourth tarsal joint without lobes.

♂. Sixth ventral segment triangularly emarginate.

Length 4½ mm.

Hab. INDIA, W. Almora (*H. G. C.*).

One male. Separable from the other species, *D. minor* excepted, by its small size, less developed head, comparatively short prothorax, brassy upper surface, etc.

16.—*Dianous minor*, n. sp.

Brassy above, the under surface and legs blue or bluish, the antennae and palpi black; shining, sparsely, finely pubescent, the prothorax and elytra almost bare. Head not very broad, considerably wider than the prothorax, closely punctate, the intra-ocular grooves deep; eyes rather small; antennae comparatively short. Prothorax barely as long as broad, rounded at the sides anteriorly, narrowed behind; closely, rather coarsely, irregularly punctate,

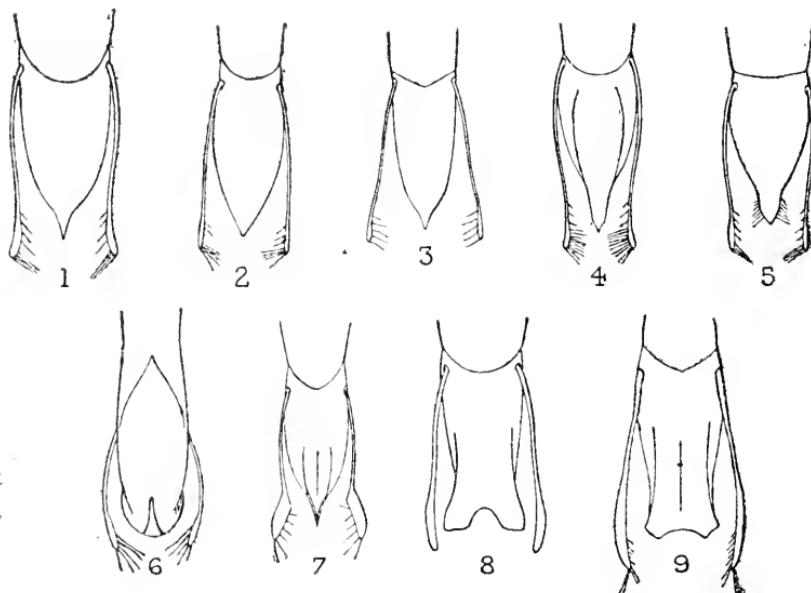
rugosely so at the base; with a deep oblique groove on each side of the disc, together forming a V-shaped depression. Elytra ample, much wider than the head, a little longer than broad, rounded at the sides posteriorly; depressed along the suture anteriorly, within the humeri, and across the middle; closely, coarsely punctate, the punctures more or less confluent, and separated by oblique or sinuous, radiating rugae on the depressed portion of the disc, and by transverse rugae along the basal half of the sutural space. Abdomen densely, minutely punctate; anal brushes long. Legs short; fourth tarsal joint without lobes.

♂. Sixth ventral segment triangularly emarginate.

Length 4–4½ mm. (♂ ♀.)

Hab. INDIA, W. Almora (II. G. C.: iv. 1918).

Very near *D. aereus*, but with much shorter antennae, less elongate palpi and legs, and smaller eyes, there being nothing intermediate in the five examples sent, which include ♂ and ♀. The head is relatively smaller than in the larger Indian forms.



EXPLANATION OF FIGURES OF ♂ GENITAL ARMATURE.

Nos. 1–5 and 7–9, median and lateral lobes, ventral aspect, and No. 6, ditto, dorsal aspect, the exposed portion of the sac and the basal part of the median lobe omitted. $\times 24$: 1, *annandalei*; 2, *caeruleonotatus*; 3, *cyanogaster*; 4, *lobigerus*; 5, *distigma*; 6, *andrewesi*; 7, *radiatus*; 8, *tortuosus*; 9, *subvorticinus*.

17.—*Dianous pilosus*, n. sp.

Cynneous, shining, the antennae and palpi black, the elytra with a large, transverse, flavous spot on the disc (not reaching the suture or lower margin)

just beyond the middle; the head, prothorax, and elytra coarsely, closely punctate, and somewhat thickly clothed with long, fine, erect hairs, the abdomen minutely punctate and more sparsely pilose, the ventral surface cinereo-pubescent. Head moderately broad, the intra-ocular grooves deep, the eyes rather large. Prothorax longer than broad, convex, much narrower than the head, rounded at the sides, sinuously narrowed towards the base, without definite grooves or depressions on the disc. Elytra subquadrate, about as long as broad, wider than the head, depressed along the suture. Fourth joint of anterior and intermediate tarsi somewhat deeply emarginate, appearing sub-bilobed.

δ . Fifth ventral segment depressed down the middle posteriorly, the sixth deeply triangularly emarginate.

Length 6½–7 mm. ($\delta \varphi$.)

Hab. CHINA, Da-zeh, near Tychau, Province of Che-kiang (Dr. P. W. Bassett-Smith, ex J. J. Walker: xii.1892), Ningpo (ex coll. Sharp).

Separable from *D. coeruleascens* Gyll. by its narrower general shape, the coarsely punctured, pilose head, prothorax, and elytra, and the transverse elytral spot. Compared with the N. American *D. nitidulus* Lec., the prothorax and elytra are more closely and much more coarsely punctate, the elytra longer, etc. The six examples seen are all contained in the British Museum, five of them having been captured by Dr. Bassett-Smith.

Horsell.

January 8th, 1919.

A NOTE ON THE BRITISH REPRESENTATIVES OF THE GENUS
MACROPSIS LEWIS; WITH DESCRIPTIONS OF TWO NEW SPECIES.

BY JAMES EDWARDS, F.E.S.

The genus *Macropsis* Lewis is composed of Cicadina having two ocelli on the face, the antennae inserted beneath an oblique flange, the striation of the pronotum running obliquely caudad from the middle-line, an intermediate cross-vein m-cu in the elytra, and multispinose hind tibiae quadrangular in section.

Macropsis decoratus, n. sp.

φ . Crown brown, broadly yellow next each eye. Face greenish-yellow, a black or brown point on each side just below the forehead, the comma-shaped spots below the middle black, brown, or absent. Pronotum brown, becoming paler at the margins, behind each eye an irregular oblong black patch. Scutellum bright yellow with a large black triangle on each side of the base. Elytra brown in their basal half, the remainder whitish-hyaline; cell Sc dark

brown from the base to the half-length or thereabouts; just beyond the apex of the clavus a pale brown cloud reaching from the dorsum about half-way across the elytron. Abdomen above brown, the hind margin of the segments broadly greenish-yellow. On each side of the prosternum a round black spot. Legs greenish-yellow, base of hind tibiae with a black point, claws blackish. Genital valve triangular, about three times as long as the preceding segment, with a small rounded notch at the apex. Saw-case five times as long as the genital valve.

Length 5·2 mm.

Bath (*Edmonds*: 1915); two females.

Most nearly resembles *M. nassatus* Germ., from which it differs in the colour-pattern of the elytra.

Macropsis populi, n. sp.

♂. Upperside yellow-brown, in life inclining to reddish. Face greyish-yellow with a sharply-defined black spot at the summit and, sometimes, four black or brown points, one on each side just below the level of the unpaired spot and two a little below the middle about equidistant from each other and the side of the face. Pronotum fuscous on the disc, the middle line sometimes pale. Scutellum usually with a large black triangle on each side of the base. Elytra: costa narrowly and the veins brown; a suffused brown band, including intermediate m-cu, from Cu to R; appendix and apical cells sometimes brown. Abdomen above black, pale at the base. Legs pale, hind tibiae with a black point at the base.

♀. Sometimes similar to, but paler than, the ♂; more frequently apple-green with the elytra suffused with pale reddish-brown along the dorsum and termen. Abdomen wholly or in greater part pale. Genital valve twice as long as the preceding segment, truncate-triangular with an angular notch in the middle of its distal edge. Saw-case about four-and-a-half times as long as the genital valve.

Length 4·25-5·33 mm.

On Lombardy poplar, Goring, Oxfordshire (*E. A. Butler*: August 1918).

Most nearly allied to *M. fuscinervis* Boh. Notwithstanding a certain amount of similarity of description, there is no need to confuse the green female of *M. populi* with the ab. *graminea* of *M. virescens*; the latter lives on *Sulcicess*, is much paler in colour, and seldom develops reddish-brown colouring on the elytra.

The following is a table of the British species of the genus:—

- 1 (26) Crown short, but not linear.
- 2 (19) Front edge of crown nearly rectangular, face flat.
- 3 (4) Species entirely pale green; at most with a black point on the summit of the face *virescens* Fab.

- 4 (3) Species not entirely pale green.
 5 (8) Face without distinct black spots.
 6 (7) Elytra without a brown line next the costa, usually with a wide irregular brown band across the middle. Insect lives on sallow. *cereus* Germ.
 7 (6) Elytra with a brown line next the costa, without a dark band. Insect lives on elm *ulmi* Scott.
 8 (5) Face with one or more black spots.
 9 (12) Hind femora with a black or dark-brown streak on the upperside which does not reach the base.
 10 (11) Narrower and more pointed in front; elytra with two wide ill-defined fuscous bands *distinctus* Scott.
 11 (10) Wider and less pointed in front; elytra without fuscous bands. *impurus* Boh.
 12 (9) Hind femora entirely pale.
 13 (16) Face without a black spot at the summit.
 14 (15) Elytra brown from the base to beyond the half-length, afterwards whitish-hyaline with a brown cloud on the dorsum reaching about half-way across the elytron, a black or dark-brown stripe on the basal half of the costa *decoratus* Edw.
 15 (14) Elytra variously coloured, but not as in *decoratus* *nassatus* Germ.
 16 (13) Face with a black spot on the summit.
 17 (18) Elytra: cells 1st R and 2nd M quite hyaline. *fuscinervis* Boh.
 18 (17) Elytra: the cells last-named not hyaline *populi* Edw.
 19 (2) Crown rounded or scarcely angular in front, face somewhat convex.
 20 (25) Elytra hyaline with a brownish-yellow tinge, the veins dark brown or black.
 21 (24) Upper pair of facial spots roundish, free. Clypeus without a distinct keel. Black lines on the inner- and undersides of hind tibiae, when present, continuous.
 22 (23) Upper division of the side of prosternum with a wide black band reaching from side to side, the lower division unmarked or rarely with a black point. Insect lives on *Rubus* *rubi* Boh.
 23 (22) Upper division of the side of prosternum with a large roundish or oblong black spot, the lower division often with a roundish black spot about half the size of the one on the upper division. Insect lives on *Salices* *scutellatus* Boh.
 24 (21) Upper pair of facial spots somewhat comma-shaped, their inner sides more or less connected with the unpaired spot. Clypeus with a longitudinal keel. The black lines on the inner- and undersides of the hind tibiae widely interrupted in the middle. Insect lives on nettle *tibialis* Scott.
 25 (20) Elytra lacteo-hyaline *nanus* H.-S.
 26 (1) Crown linear *tiliae* Germ.

Four sections of the genus are indicated by our species, exemplified by *virescens* Fab., *rubi* Boh., *nanus* H.-S., and *tiliae* Germ. respectively. The members of the *rubi* group may be regarded as elementary or

"Jordan's" species—troublesome, no doubt, to systematists whose attention is confined to museum specimens, but not to be neglected on that account by those who wish to study insects as living things. Single examples without data may defy anyone to refer them with certainty to either of the three categories, but in a gathering of moderate quantity from *Rubus*, *Urtica*, and *Salix* respectively the majority of specimens will be found to exhibit the characters proper to their kind.

In dealing with Jassids one finds that in most cases where there is a colour-pattern distinctive of a particular species, the percentage of specimens exhibiting *all* the elements of that pattern is very small. This circumstance has not hitherto received the attention which it deserves, and the failure to appreciate it has led to much misapprehension as to the limits of natural categories in these insects. It has been shown in the case of some fungi that certain morphological characters are due to food-factors; and there is reason to believe that this is also the case in some Cicadina, e.g. the *rubi* group of *Macropsis*; the kinds of *Oncopsis* living on alder, birch, hornbeam, and hazel respectively; *Zygina coryli* Toll., *alneti* Dahlb., and *mali* Edw. and so on.

Colesborne, Cheltenham.

February 10th, 1919.

NOTES ON SAWFLIES (PTERONUS PINI AND PTERONUS SERTIFER).

BY T. A. CHAPMAN, M.D., F.R.S.

(PLATES I-III.)

My acquaintance with these two species depends on material supplied by Mr. E. E. Green, and still more is owing to the information he has given me as to their habits, etc. He has also very kindly furnished certain drawings, reproduced herewith.

A first point of interest in these species is that *Pteronus sertifer* is another sawfly that passes the winter as an egg. Perhaps the most unusual habit that they have, is that instead of making room for their eggs by pushing aside the tissues of the plant amongst which they are laid, usually by elevating the cuticle, the space required for the eggs is made by actually excavating the material from the area they will occupy.

I do not know whether anything has been previously said about the egg-laying of *Pteronus sertifer*, except in Mr. Green's recent report to the Entomological Society,* but that of *P. pini* is, in a sense, well-known,

* Proc. Ent. Soc. Lond. 1917, p. 1.

though the only description of it I can find is by a German author, and is erroneous in the most important particular.

As regards the actual egg-laying, I was unfortunate in never succeeding in seeing the actual process. With many of these sawflies, *e.g.* species of *Trichiosoma*, *Cimbex*, *Rhadinoceraea*, etc., as soon as a suitable piece of the food-plant is offered to a ♀ fly, she, practically at once, proceeds to egg-laying, and there is no difficulty in observing the process; but with neither *P. pini* nor *sertifer* did anything of this kind occur. I kept watch for considerable periods, both immediately after placing the flies on the plant and subsequently, but never saw any attempt at egg-laying. Possibly this occurs most usually during darkness. I once, however, found a ♀ of *P. sertifer* that had just completed laying an egg. This was my nearest approach to success.

When we examine a fir needle in which *P. pini* has laid eggs, we find a considerable length of one margin has a covering of greyish-green material. The extent of this may be gathered from Plate III, fig. 1, which is a magnified stereoscopic view of such a pine leaf or needle. Such a leaf is, of course, very obvious amongst its fellows.

The German account of this structure regards it as consisting of material supplied by the sawfly and describes the egg as being covered by it, but as itself lying outside the substance of the leaf. This is not so; the egg is in the substance of the leaf, and the added material consists of the particles excavated to make room for the eggs, with almost certainly some agglutinating matter supplied by the sawfly. The arrangement of this material is very regular and elaborate, and may be understood by examining the drawings by Mr. Green on Plate I and the photographs on Plate II.

Mr. Green makes the following observations on the needles of pine with eggs of *P. pini*:—"I think that you are correct in considering that the lateral ridges are composed of secretory matter—small vacuoles or bubbles can be distinctly observed in the material. You note that 'these side lines are divided into portions corresponding to the eggs.' My examination showed me that the median ridge is similarly divided; its divisions are slightly behind those of the lateral ridges, so that they have the appearance of being '*en echelon*.' Moreover, the anterior extremity of each division (of the median ridge) is carried forwards and sideways to meet the corresponding sections of the lateral ridges on each side. On Plate I rough sketches are given of the arrangement, as I see it. The lower drawing, fig. 2, is, of course, diagrammatic and is intended to represent the arrangement as viewed from above.

The upper drawing, fig. 1, shows a side view of the median and one lateral ridge, as seen by me under a 2" objective."

If this material be removed the fir needle has much the appearance of any other and one does not at first notice that anything has been done to it. In certain lights, however, it can be seen that that margin of the leaf is not quite of the same colour and texture as the rest. A closer examination shows that an incision has been made just within the margin of the (upper or inner or) concave surface of the leaf, but so exactly has this been closed that it needs some care to determine that there really is such an incision and its precise position. Below it is a continuous cavity containing a series of eggs, one to each of the elements of the outer encrustation.

I have added to Plate III photographs of petioles of poplar with eggs of *Cladius riminalis*, that ought properly to have appeared on page 11 of the last volume of this Magazine in connection with that species, and a very fine photograph, also by Mr. Main, of the tip of a willow leaf with eggs of *P. (Nematus) salicis*, a species that very closely resembles *C. riminalis*, but is larger and, of course, differs from it in essential characters generically.

In October 1917, I found eggs of *P. sertifer* laid in pine needles exactly as described by Mr. Green. The chief point of interest I noted was that until examined by transmitted light the needles seemed intact and undisturbed. In November 1918, I obtained further needles in which *P. sertifer* had laid in my jars. One afternoon I found a *P. sertifer* ♀ with a little mass of green material just in front of the (retracted) terebra. I fancied she had just been ovipositing, but the material may have been there a considerable time, as I suppose that it ordinarily drops away as soon as the egg is laid. This observation, however, is the only one that disagrees with my suspicion that the eggs are laid in the dark.

The eggs then of *P. pini* and of *P. sertifer* are laid in the same position in the pine needles, and the incision through which they are laid closes up so as to be difficult to detect. The details, however, are very different. *P. pini* lays her eggs in a continuous groove, *P. sertifer* in separate pockets, which are from 2 to 3 mm. apart. The eggs are about 1·7 mm. long and 0·6 mm. in diameter, prolate spheroids. When *P. pini* lays her eggs she removes the material from the continuous groove and disposes it (with some other material provided by herself) along the margin of the leaf over the groove. *P. sertifer*, on the other hand, collects the material excavated in the form of a small mass of rounded nodules, very like the frass of a larva, which gradually accumulates basal

to the terebra, whence it is dropped, probably one mass for each egg. I have noted finding one such mass still attached to the fly, but similar pellets in some numbers lay on the floor of the jar.

It is curious that *P. pini*, whose eggs hatch not very long after they are laid, should protect them with a thick covering, and *P. sertifer* should not do so, though her eggs have to remain *in situ* unhatched throughout the winter.

Amongst the few sawflies whose egg-laying I have watched, these are the only ones that remove actual material from the cavity formed to receive the egg, and I note that, in mounting the saws for examination, the basal mass (the bones and sinews through which the saws are worked) is very solid and massive. The saw itself is rather short, very robust, and armed with a row of teeth on each section, that are stronger than in most sawflies, and seemed calculated to rasp out material as they are retracted.

Both species cast their larval skins immediately before spinning up.

Plate I, fig. 3, shows the method of feeding gregariously that is followed by *P. pini* in its first larval instar, and less constantly in the second. If a larva be separated from its companions and isolated, it does not thrive and usually dies, but I did not experiment on this point sufficiently often to say that this is always the case. One can easily understand how a solitary larva of a species that lives gregariously in a nest or under a web, such as, for example, *Thaumatopea pityocampa*, the pine-processionary moth, is unable to thrive when deprived of the protection enjoyed with its fellows, but it is less easy to see why it should be so in species such as *P. pini* and *Cladius viminalis*. It seems very possible that the process of feeding on a narrow strip of tissue is very difficult, unless the adjacent strip is being at the same time removed by its neighbour.

Many of these sawflies have a curious habit, the use of which seems very obscure. If a few ♀♀ of these are placed together in a jar or cage, with a good deal of room where any collision would seem unlikely unless actively sought for, it is not long before some, and a little later nearly all, are mutilated by the loss of one or more legs or antennae, bitten off by their neighbours. This occurs with *Cladius viminalis*, *Rhadinoceraea micans*, *Phymatocera aterrima*, and both these species of *Pteronos*. For example, Mr. Green sent me five ♀♀ of *P. sertifer* on October 25th, 1917; these were dead on October 30th, having been placed in a jar with branches of *Pinus sylvestris*. Three still had their legs and antennae perfect, one had a 2nd leg wanting, another two legs abbreviated.

October 8th, 1918.—During some cold days none had emerged; to-day, being fine, I put the jar containing the cocoons in the sun. About an hour later I found that fifteen had emerged, and another did so whilst I was counting them. Of the fifteen, eight were perfect, seven had already been mutilated—three had lost a leg, one had lost two legs, and three had lost an antenna.

If more than one specimen were placed in a jar with a piece of pine for oviposition, in twenty-four hours all or all but one were much mutilated and helpless.

EXPLANATION OF PLATES I-III.

PLATE I.—Fig. 1. Drawing of egg-covering of *Pteronotus pini* on margin of a pine needle at basal end of leaf: *a*, median ridge; *b*, lateral ridge. A lateral view. Fig. 2. Vertical (or marginal) view of cover, somewhat diagrammatic. Fig. 3. Young larvae of *P. pini*, showing social method of feeding, $\times 1\frac{1}{2}$. Fig. 4. Needles with egg-pockets of *P. sertifer* (diagrammatic), $\times 4$, from specimens mounted in balsam; the irregular margin opposite the pockets is due to pressure forcing the thin walls of the pockets out of shape; the living specimens show no indications of the margins or openings of the pockets.

Figs. 1, 2 & 3 are by Mr. E. E. Green.

PLATE II.—Photographs, lateral views, of egg-covering of *P. pini*, by Mr. F. N. Clark. Figs. 1 & 2 $\times 15$, 3 & 4 $\times 20$.

PLATE III.—Fig. 1. Stereoscopic photograph of needles with eggs of *P. pini*. Figs. 2, 3. Eggs of *Cladus viminalis* in petioles of poplar (Ent. Mo. Mag. vol. liv, p. 11). Fig. 4. Eggs of *Pteronidea (Nematus) salicis*. All enlarged. These photographs are by Mr. Hugh Main.

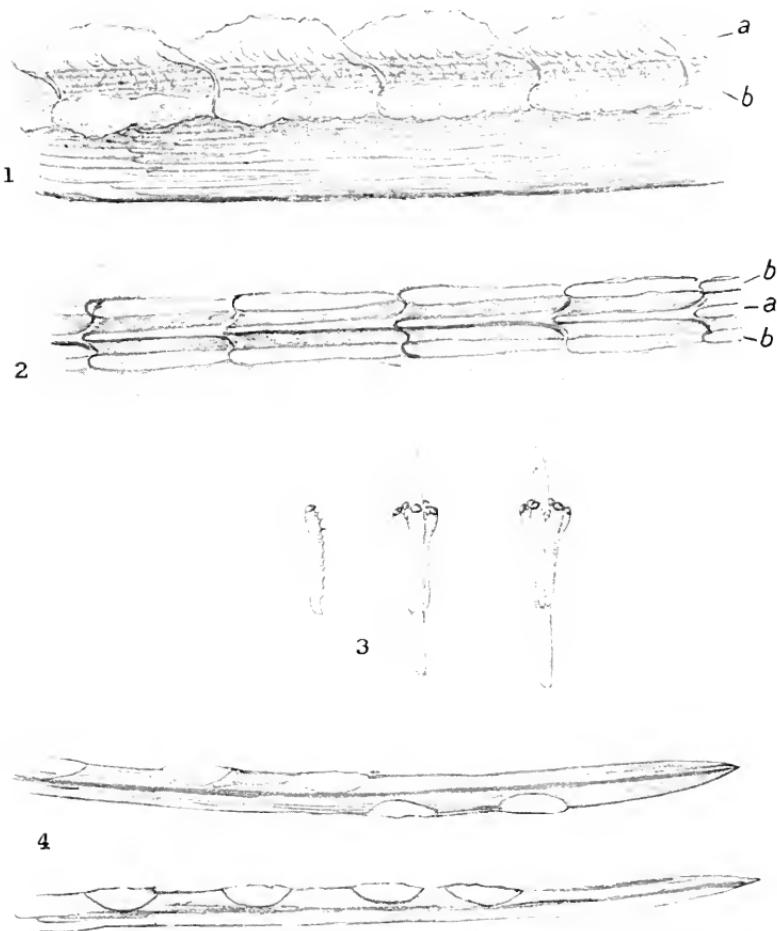
Reigate.

January 1919.

ALLANTUS PERKINSI, n. sp.—A NEW BRITISH SAWFLY.

BY THE REV. F. D. MORICE, M.A., F.Z.S.

We seem to have two really distinct, though extremely similar, species mixed in most collections of Sawflies under the name *Allantus arcuatus* Forst. Dr. R. C. L. Perkins some years ago called my attention to this, but at the time I was not inclined to agree with him that the differences which he pointed out were of specific value. Some of these, at least, were of a kind which in many other cases I had found to be inconstant, and I was probably influenced by observing that practically all recent describers (Cameron, Konow, Enslin, etc.) represent *arcuatus* as an exceptionally variable species, and that, though many attempts had been made to separate from it particular forms as distinct,



Drawings 1, 2 and 3 by E. E. Green.

PTERONUS PINI AND P. SERTIFER.

1 & 2. Pine leaves with egg-deposit of *P. pini*; 3. Young larvae of *P. pini*; 4. Egg-cavities of *P. sertifer*.

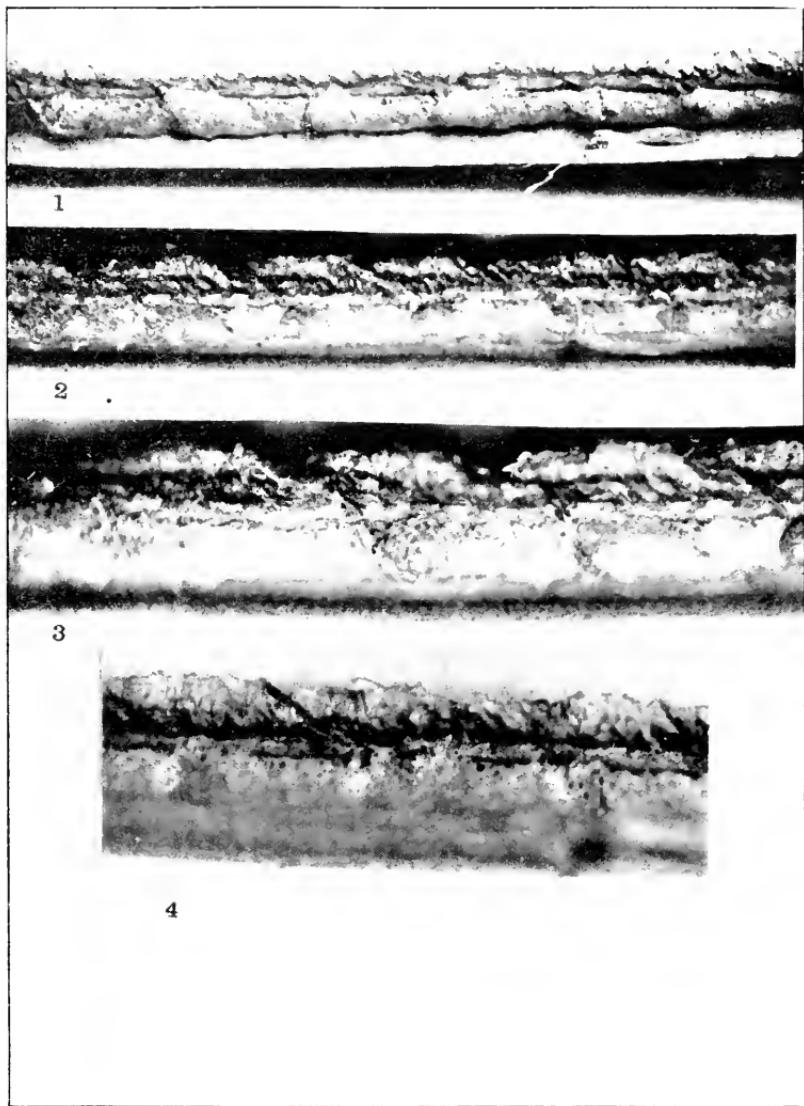
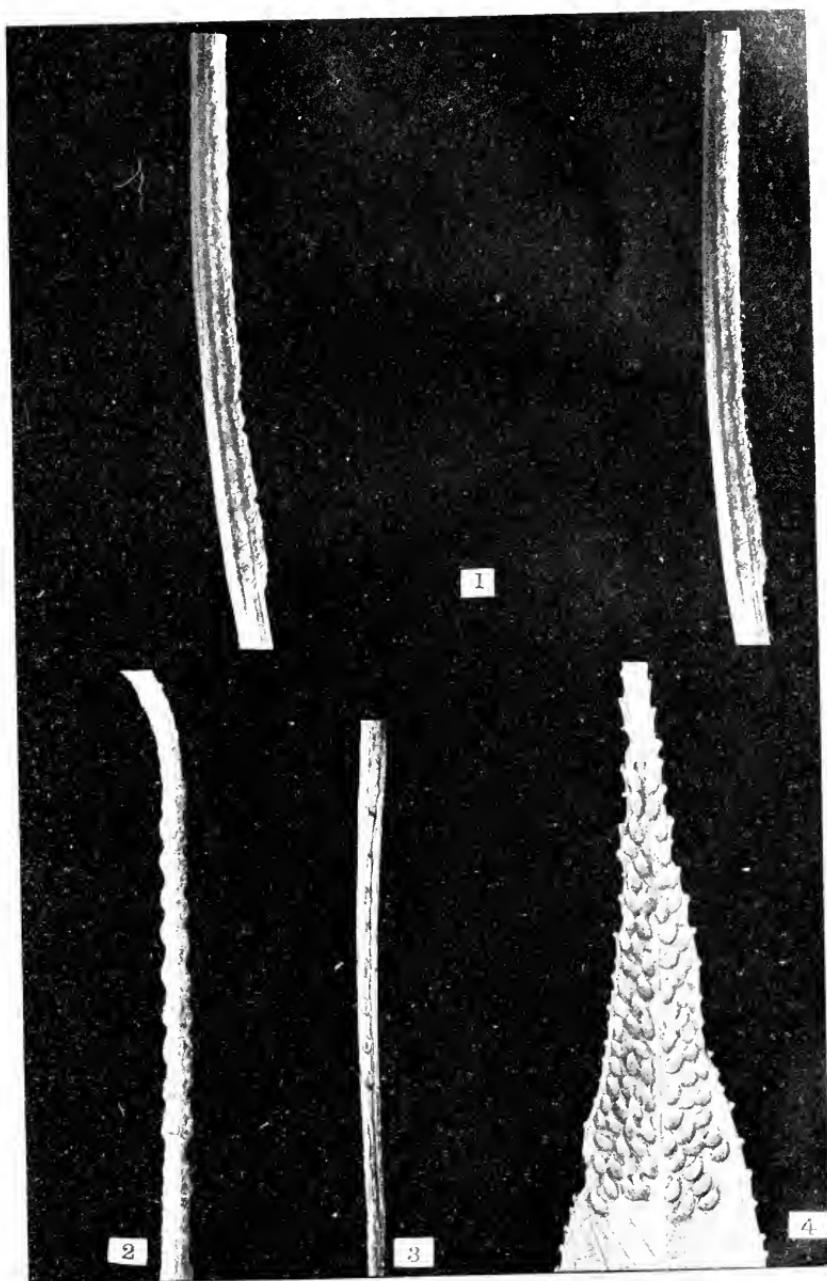


Photo F. N. Clark.

PHOTOGRAPHS OF EGG-COVERING OF PTERONUS PINI.

1 & 2 \times 15; 3 & 4 \times 20.



CHARLES H. MORSE

1. PTERONUS SERTIFER (STEREOSCOPIC) EGG-COVERING.
- 2, 3. CLAUDIUS VIMINALIS.
4. PTERONIDEA SALICIS.

later authors had apparently in all cases restored them to it as mere aberrations or, at most, subspecies (= local forms). As a matter of fact, both Dr. Perkins and myself have since found that such of the differences in this case as depend on colour (greater or less extension of yellowish markings), though *nearly* constant, are not so absolutely. One external character, however, seems to be definite, and practically invariable—a difference, namely, in the sculpture (punctuation, etc.) of the head and the mesonotum. And I now find, after dissecting and examining carefully the ♀ ovipositors in many specimens of both forms, that the two can be separated quite easily by the very different structural details in their saws. I have as yet met with no case in which this character has failed me, and am satisfied that the difference is sufficient to justify a separation of the two forms as distinct species, one of which—but, of course, not both—must retain the name proposed by Forster, who, so long ago as in 1771, described *arcuatus* from English specimens.

In one of these forms, both sexes have the parts of the head (viewed from above) which lie between the “vertical area” and the compound eyes remotely, and rather feebly and irregularly, punctured, with polished shining intervals between the punctures. The punctures of the mesonotum are pretty close and regular, but not so close as to make its surface appear opaque. The scutellum is, I believe, invariably marked with yellow, and, as a rule, entirely of that colour. The antennae generally have a yellow mark on the basal joint, but this character sometimes fails. The ♀ ♀ have a sharply-defined yellow fascia covering the greater part of the apical margin of the propodeum, but always (I believe) distinctly *abbreviated on each side*, and so *not becoming confluent with the yellow markings of the ventral surface*. (N.B. These markings in fresh specimens are more or less greenish, but after death soon turn completely yellow.)

In the other form, the spaces between the vertical area and the eyes are almost opaque, coarsely and closely punctured; the punctures of the mesonotum are also rather large (coarse and close) and its surface comparatively dull. The scutellum is almost invariably black, but Dr. Perkins has just sent me a ♀—the first with such a coloration ever seen by either of us—in which it is partly yellow! On the other hand, the yellow fascia on the propodeum seems to be really invariably *complete* (*i. e.* not abbreviated laterally, but running along its whole margin and so uniting at last with the yellow of the ventral surface). This is the case in Dr. Perkins's specimen just mentioned, and it would be difficult to say to which of the two forms it ought to be referred, were it not for the

close puncturation of its head and the structure of its saw. Both these indicate that it belongs to the form now under consideration, and not to that described in my last paragraph.

The basal joint of the antenna is commonly more or less marked with yellow in both forms, but it is not invariably so in either. The form with normally black scutellum generally shows (especially in the ♂♂) broader yellow fasciae at the margins of the intermediate abdominal segments (from segment 3 onwards), but this character, again, is variable.

Two questions, then, arise, viz.: 1. Which of these forms is to retain the name *arcuatus*? and 2. What shall we call the other?

1. As Forster expressly states that the scutellum of *arcuatus* is yellow, and nothing in his description except this seems more characteristic of one form than of the other, it would seem that we ought to apply his name to that which I have first mentioned in this note—viz., the species with normally yellow scutellum, propodeal band (in the ♀) normally abbreviated laterally, shining head, and saw of the ♀ with details as in fig. 1 (*infra*).

2. For the other, I propose the name *perkinsi*, n. sp., in honour of its real discoverer, since I cannot satisfy myself that it is identical with any of the forms described by authors, either as subspecies of *arcuatus* or as species related to it. Several of these have a black scutellum, but each of them is separated from *perkinsi* by some apparently constant external character, and their saws, so far as I have examined them, are all of the *arcuatus* type.

The difference in the saws of the two forms is more easily explained by a figure than by a detailed description. I have, therefore, photographed a specimen of each (mounted in balsam) at the same magnification and with the same lighting and time of exposure (see figs. 1 and 2). The so-called "teeth" of these saws will be seen at once to be shaped quite differently, and I find these differences constant in all the specimens which I have examined.

Both species seem to be common and generally distributed, occurring side by side in many very different districts, e.g., I have seen both from Devonshire, Surrey, Lancashire, etc. (and probably from many other counties without recognizing them as distinct species). According to all tabulations known to me—Cameron's, Konow's, Enslin's, and my own in Ent. Mo. Mag. July 1912—they fall under the definition of *arcuatus*; but the evidence of their saws seems to me conclusive against specific identity.

I have specimens of true *arcuatus* from many Continental localities, and it seems to be as common in most parts of Europe as with us. Of *perkinsi*, however, I have only found one foreign specimen in my collection, namely, a ♀ from "Auvergne" (at least it is so ticketed!), not taken by myself, but perhaps by the late Rev. T. A. Marshall, several of whose captures were given to me by Mr. Edward Saunders some years ago. The "saws" of this, as well as its other characters, agree with those of British specimens. *A. nitidior* Knw. and *brevicornis* Knw. somewhat resemble *perkinsi* in general appearance, but the saws of both are as in *arcuatus*, of which Enslin considers both to be varieties. Also in *nitidior* the head is expressly said to be shining and very sparsely punctured, and in *brevicornis* the tegulae are black.

The following may serve as a brief diagnosis of the new species:—

Allantus perkinsi, n. sp.

Allantus A. arcuato simillimus. Differt scutello fere semper immaculato nigro: margine propodei apicali (ut videtur) semper toto flavo: praecipue vero



Fig. 1.—*Allantus arcuatus* Forst.



Fig. 2.—*Allantus perkinsi*, n. sp.

terebrae ♀ armatura ut in fig. 2, longe alia atque in *arcuato* fig. 1. Capitis (desuper visi) latera (inter oculos et verticem) subopaca, confertim rugulose punctata, punctis magnitudine variantibus, nonnusquam confluentibus. Cetera ut in *arcuato*, sed thorace minus nitido, et flavedine abdominis saepius aliquanto magis extensa.

Woking.

January 1919.

A RIBBON-MAKING FLY :
THE OVIPOSITION OF *CERATOPOGON NITIDUS* MACQ.
BY A. H. HAMM, F.E.S.

For a few days last August I was spending part of my holiday at the picturesque little village of Woolhampton, near Newbury, Berks. The evening of the 13th was very warm and sultry, and the various "biting" flies, such as *Anopheles*, *Culex*, *Ceratopogon*, and *Simulium*, were feasting upon all and sundry. I often had three or four *Culex pipiens* on my hand at one time, but, fortunately for me, their "bite" leaves no after-effect.

I was patiently watching, on the bank of a stream running through one of the numerous osier-beds that are such a feature of this part of the Kennet Valley, several species of *Hilara*, especially *H. lurida* and *H. nigrina*, the males of which were very busy catching their "prey" and afterwards going through their usual courtship tactics. It was while thus occupied that I noticed, hovering above the surface of the stream, a fly that had something white hanging beneath it. Thinking it was another species of Empid with "prey," I netted and boxed the fly, and then recognised it as a *Ceratopogon*. I then made a hasty examination with a lens of the object which the fly had dropped in the net, and was surprised to find it was a gelatinous ribbon of ova. I then saw and netted several other flies hovering over the stream, with similar ribbons. They hovered (with little or no perceptible movement) about two feet above the stream and then immediately began the work of ribbon-making. By patiently watching one could observe the operation, occupying about three minutes, from start to finish. Gradually the ribbon, hanging vertically from the very start, would lengthen, until the full number of ova had been extruded. I could not determine whether the legs contributed in any way by holding and paying out the ribbon during its extrusion; for nearly all the flies kept in mid-stream, and the light, just before sunset, was none too good. When its full length was attained the fly, still poised motionless in the air, dropped the ribbon into the stream beneath, where it gradually sank as it was borne along by the fairly rapid current.

The following measurements, for which I am indebted to my friend Dr. Eltringham, were made from a dry and probably shrunken ribbon, which, moreover, was not of maximum length, as the fly was netted before its completion :—

Length of ribbon, 19 mm. Width of ribbon, .22 mm.

There are 30 ova per mm., making 570 ova in all.

The eggs, which lie obliquely across the long axis of the ribbon, are, when fresh, white with a faint yellow tinge.

Mr. F. W. Edwards, to whom the mode of oviposition was unknown, has kindly identified the species as *Ceratopogon nitidus* Macq., and has drawn my attention to an interesting and somewhat analogous procedure on the part of an American species, as described by O. A. Johamsen in the 58th Annual Report of the New York State Museum, 1904, vol. v, p. 107 :—

“AQUATIC NEMATOCEROUS DIPTERA.—II.

“*Sphaeromyas argentatus* Loew.

“The egg-laying of this species was first observed by Professor Needham, by whom my attention was called to it. During the latter days of June and the first of July about sundown, the female fly hovers about three or four inches above the water's surface close to the shore in a place sheltered by the shrubs and weeds. With the head pointing towards the shore and the body swaying rhythmically laterally to and fro, the egg-laying begins. The eggs are enclosed in a gelatinous ribbon, placed at right angles to the long axis. . . . The ribbon when deposited is about 1·5 inches in length, flat, and appears wrinkled like a paraffin ribbon. The lateral swaying of the body at the beginning of the egg-laying is of about one inch amplitude, but as the ribbon of eggs increases the amplitude decreases, until just before deposition it is less than $\frac{1}{2}$ inch. When the egg-string is about $\frac{1}{4}$ inch long the fly seizes it with her hind and middle legs, the hind legs guiding, the middle legs paying out the string as its length increases. The fore legs are folded up under the body. This egg-laying process occupies from three to five minutes; when completed the fly suddenly darts down to the water's surface, deposits her eggs and flies away.

“The eggs when first laid are whitish, but later, as development progresses, they become brown. Each egg is about 0·4 mm. in length by 0·7 in width; somewhat pointed at one end and flattened at the other, the latter with a minute rectangular bolster with knobbed corners.”

22 Southfield Road, Oxford.

February 13th, 1919.

A revision of the species of Cathormiocerus Schönh., of the Iberian Peninsula and Marocco; by Manuel M. de la Escalera.—This “Revision” forms No. 38 of the Zoological Series of the “Trabajos del Museo Nacional de Ciencias Naturales,” Madrid, pp. 64 and 61 text-figures, and is dated Dec. 30th, 1918. It is, of course, based upon the species inhabiting Spain, Portugal, and Marocco, but some remarks are made upon the two forms recorded from the southern or south-western coasts of Britain (examples of both of which have been examined by the author), and a variety of one of them, from Brittany, is noticed. Fifty-five species are enumerated—thirty-seven of which are restricted to the Iberian Peninsula,—exclusive of eleven other described forms

unidentified by him. Four subgenera are recognized, one of which, *Mitomermus* Duv., is placed as a synonym of *Trachyphloeus* Germ. in the European Catalogue of 1906, our *C. socius* Boh. and *C. maritimus* Rye belonging to *Cathormiocerus* s. str. The 61 text-figures, all drawn under the camera lucida, $\times 34$, show the form of the anterior tibiae in each of the subgenera, and the head, antennae, etc., of most of the species. These apterous epigaeous weevils have, as might be expected, a very limited distribution, though some of the allied *Trachyphloeus*, like *scabriculus* L., may sometimes be found in quantity in unexpected places. No additional localities are given for *C. socius* (the type of which was from England, from Walton's collection), beyond the Isle of Wight and the Sierra Nevada in Spain, the *C. socius* of Seidlitz, Bedel, and Chevrolat apparently belonging to other species. The variety of *C. maritimus* from Brittany is named *armoricus*. Another British representative of this genus, from the Lizard, Cornwall, sent me some time ago by Mr. Keys for determination, not seen by M. Escalera, must remain unidentified till an example in better condition is obtained. Numerous new species and varieties are described and figured in the "Revision," one of which, from the Alto Atlas, is called *C. tizi-n'testi* (sic), a specific name to which one might take exception. The material captured by Commander Walker and myself in Spain has been examined by the author and is included in his enumeration. The geographical distribution of *C. socius* remains inexplicable.—G. C. CHAMPION, Horsell, Woking: February 1919.

Cerycon sternalis Sharp at Oxford.—The publication of Dr. Sharp's paper "On some species hitherto assigned to the genus *Cerycon*" (Ent. Mo. Mag. 1918, pp. 274-277) has induced me to send him for examination the material collected by myself in this district, more especially as I was responsible for the record *C. lugubris* from Oxford. He has kindly named them and says:—"You have separated your *Cerycon*'s correctly, but your *granarius* is *lugubris*, and your *lugubris* are *sternalis*," meaning I had separated them into species, but applied the names wrongly. On August 12th, 1908, I took about 18 specimens of what proves to be *C. sternalis*, from wet moss at Yarnton, Oxon. On January 26th, 1908, at Yarnton also, I captured a specimen which turns out to be *C. lugubris*. I have *C. lugubris*, var. *intermixtus*, teste Dr. Sharp, from Water Eaton, Oxon, taken on July 29th, 1907, and one example from Weston-on-the-Green, Oxon, April 18th, 1909. The long series I called *C. lugubris* and the three examples *C. granarius*. Curiously enough, I have only one example of *C. minutus* from Oxford, this I named correctly.—J. COLLINS, 74 Islip Road, Sunnymead, Oxford: February 19th, 1919.

Note on Nomada roberjeotiana Panz.—The species figured by Panzer is, I think, clearly distinct from that which stands under this name in our lists and collections. The male of the true *roberjeotiana* has a single bright flavous transverse yellow spot on the scutellum, much like that of *rufipes* F. (*solidaginis* Panz.), the ♀ has a bright yellow prothoracic band like the male, and the hind tibiae with a definite, wide, black ring. In both sexes the hind femora are pale to a far greater extent than in the British species. If Panzer's figures are correct in this respect, the antennae are also decidedly shorter and thicker. Continental writers give *Andrena afzeliella*, *fuscipes*, and *xanthura* as

hosts of *roberjeotiana*, though it is extremely unlikely that it would attack species so widely distinct as the two former. Our species is attached solely to *A. tarsata* Nyl. (*analis* Panz.) and is particularly partial to the flowers of *Potentilla* (though Smith discovered it on the ragwort, as he repeatedly states). Altken has described a species closely allied to *roberjeotiana*, and with the same host and habits as ours, under the name of *N. tormentillae*, and though I have not seen Continental examples, I suspect that ours belongs to this species. Although I have examined large numbers of English specimens from different localities (Hants, Surrey, Devon, and Cumberland) none of these resemble Panzer's *roberjeotiana*, so that it is probably not to be found in this country.—R. C. L. PERKINS, Paignton : February 1919.

Phryganea obsoleta in Yorkshire.—Among some *Trichoptera* recently sent me to name by Mr. Rosse Butterfield, I was pleased to see a good specimen of *Phryganea obsoleta* taken at Keighley in 1918. This insect has not previously been recorded for Yorkshire. A more generally interesting species in the same lot was *Tinodes dives*, also from Keighley last year. The latter occurs at Grassington, and in abundance on the river at Malham in the same county, but one scarcely expected it so near a thickly populated district as is Keighley.—GEO. T. PORRITT, Huddersfield : February 8th, 1919.

Chrysopa dorsalis Burm. in Berkshire.—The editorial remark by Mr. G. T. Porritt (*antea*, p. 18) on the local distribution in Britain of this interesting "lace-wing," recalled to my memory that I met with the insect several years ago in a fir plantation near Bessels Leigh, Berks. I have since observed it on many occasions in this particular spot, which may be added to the few known localities of *C. dorsalis* in Britain.—J. COLLINS : February 4th, 1919.

Obituary.—It is with great regret that we have to announce the death of Dr. F. DuCane Godman, D.C.L., F.R.S., on February 19th. A detailed notice will appear in our next number.—EDS.

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY : January 9th, 1919.—Mr. STANLEY EDWARDS, F.L.S., F.E.S., President, in the Chair.

Mr. S. H. Cornish, Plumstead Common, was elected a member.

Mr. Ashdown exhibited numerous Lepidoptera taken in Surrey during 1918. Mr. Buckstone, series of 2nd brood *Agriades thetis* from Eastbourne and the Surrey Hills. Mr. Frohawk, (1) *Plebeius aegon*, very pale examples, with immaculate undersides of fore wings, and slightly striated; (2) *Aricia medon* (*astrache*), pale yellow marginal markings; (3) *Polymomatus icarus*, a female with pale yellow marginal markings. Mr. B. Adkin, (1) *Argynnis aglaja*, a pale specimen, with enlarged markings; (2) *A. cydippe* (*adippe*), pale specimen, a strongly banded underside; (3) a curious smoky *Strenia clathrata*. Mr. R. Adkin, two *Hypercallia citrinalis* (*christiernana*) from an old collection.

Mr. H. Main, a species of *Anopheles* common at Eastbourne, and a series of photographs (enlargements) of details of the life-history of *Gastrophilus equi* and *Eristalis tenax* (Dipt.), *Nepa cinerea* and *Pentatoma prasina* (Hemipt.), etc. Mr. R. T. Bowman read a Report of the Field Meeting at Chingford on May 25th. Mr. E. Step communicated Reports of the Visit to the John Innes Horticultural Institution, and of the Fungus Foray on Wimbledon Common.

January 25th, 1919.—The President in the Chair.

Annual Meeting.—The Balance Sheet was adopted, the Report of the Council was passed, and the results of the election of Officers and Council for the ensuing year announced. The President read his annual address and, after a short résumé of the work of the Society and the progress of Entomology generally for the past year, dealt with the work that was being taken up on the economic side of Entomology throughout the world. Votes of thanks were passed to Officers and Council.

Ordinary Meeting.—Mr. Bunnet exhibited photographs of the details of the life-history of *Dasydera sulphurella* and of some of the immature stages of the sawfly *Phyllostoma aceris*. Mr. Tonge, a *Phigalia peduria* taken at Reigate on November 24th last—the earliest date recorded. Mr. Bowman, aberrations of *Coconympha pamphilus*, (1) very pale, (2) very wide dark margins, (3) very dark suffused undersides, (4) ocellations on undersides much emphasised. Mr. H. J. Turner, a series of *Polyommatus dolus*, (1) typical from near Florence, (2) ab. *vittata* from the Cevennes, (3) var. *menalcas* from Asia Minor, (4) the series in the Society's (Lemann) collection. He also showed a small *P. icarus* (22 mm.) from Elba, and *Pieris manni* with gen. aest. *rossii* from the same place.—*Hv. J. TURNER, Hon. Editor of Proceedings.*

ENTOMOLOGY IN SARAWAK, BORNEO.

BY G. E. BRYANT, F.E.S.

These few notes are the result of six months' collecting, chiefly *Coleoptera*, in Sarawak, Borneo, from December 3rd, 1913–June 10th, 1914. The bulk of my work was done on Mt. Matang and at Quop. I also made expeditions to Lundu, Puak, and Mt. Merinjak. On my arrival in Kuching, Sarawak, Major J. C. Moulton, late of the Sarawak Museum, helped me in every way and engaged for me two good Sea Dayak collectors and a Chinese cook, without which faithful bodyguard I should have been helpless, and I should like to state here how greatly I am indebted to him for the success of my expedition.

I arrived on Mt. Matang on December 3rd, 1913, and collected there till February 15th, 1914, living at an altitude of 1000 feet, with jungle above and below. These months are probably all bad for collecting at an altitude of anything over that elevation during the rainy season, the mountain-top, about 3200 feet, being then frequently veiled

in mist, and from January 11th–February 15th twenty more or less very wet days were recorded in my diary. The best collecting-days here, in point of number of species of *Coleoptera* obtained, were spent at a clearing which my Dayaks made on a ridge at an elevation of about 2000 feet. On December 24th, two days after making the clearing, we took 87 species, and on the 25th 75 species; and then the rains came, and I never did very much more there, as it was too high and in the mist. It is a sight not to be missed to see the Dayaks get to work to make a clearing, with their small native axes. They start half cutting through the number of trees they wish to fell, and then drop one giant in such a way that it brings down the rest at once. It is heartbreaking to hear the tearing of limbs and the terrific crash, but glorious to let the sun into the gloom of the forest, and a clearing of this sort can be visited every day in fine weather and new species taken all the time.

On February 9th I at last found a flowering-tree which it was possible to reach, growing on the edge of a clearing at an altitude of about 1000 feet—a decidedly difficult thing to find in jungle-country. The tree was *Ternonia arborea* (Order Compositae), then covered with white fluffy flowers. I worked this tree for five days, and it produced 80 species I had not met with before, in spite of the weather being bad, and I had already up to that date taken not less than 1040 species of *Coleoptera*. It produced twenty-one *Cetoniidae*, the majority small but very interesting *Valginae*, and a few species of *Macronota*—*M. egregia* Guér., *M. picta* Guér., *M. marmorata* Wallace, and *M. elongata* G. & P. I rigged up my net with a very long handle, and it was something like hard labour wielding this from about 7.30 A.M.–3 P.M. A Dayak climbed the tree to stir things up, as most of the interesting forms seemed to frequent the top, and it was rather anxious work watching him, brandishing his net walking about on the most appalling-looking branches, and I was thankful there was no “Employers’ Liability Act” in Sarawak. The tree was alive with butterflies and bees, and I captured a good number of *Hymenoptera*. What struck me most was that not a single Buprestid was taken or seen, similar collecting in Australia producing scores of *Buprestidae*, mostly *Stigmodera*, such flowering-trees as *Angophora*, *Eucalyptus*, etc., being especially attractive there; but I found later that the habits of the Bornean *Buprestidae* were quite different. *Catoxantha opulenta* Gory, *C. rajah* Gestro, *Demochroa lacordairei* Thoms., *Chrysocroa aurotibialis* Deyr., *C. fulminans* F., and their allies, were taken on young fresh foliage; but the species of the genera *Chrysobothris*, *Belionota*, and *Philocteatus* flew about freshly-felled timber, being extremely active and impossible to

capture without a net. One member of this group, *Epidelus wallacei* Thom., when alive, is covered with a beautiful lemon-coloured powder, which is all too easily rubbed off, Museum specimens being always of a dirty yellow-brown colour.

Mt. Matang is difficult to collect upon, as it is everywhere very steep, with the exception of one fairly good path in places, leading to the summit; and where it is easy to get through the old jungle, it is generally too dark and shady, all the insect-life buzzing about at the tops of the trees. For this reason, on a fine day, the top of the mountain was a good collecting-ground, the summit having been cleared and only small bushes growing there; the so-called rare things come flying up from the jungle below from all sides, and these, with luck, may be captured with a net.

At another peak we cleared, at 2500 feet, where there was just room for three people to stand and wield nets, on one day six species of *Coleoptera* came flying over the top, all the same colour-marking, red and black—three *Cerambycidae* (*Ephies dilaticornis* Pase., *Erythrus apiculatus* Pase., and *E. sp.?*), all rare, two *Lycidae*, and a Telephorid, all three common. In jungle-collecting a great number of species are taken singly, which are not met with again in a few months' work; but this is bound to happen in thick jungle-country, as it is so difficult to get at their haunts. When one looks down from Matang all round, as far as the eye can see, the whole country one sea of trees, impossible to collect in, except on jungle-paths and clearings, to talk of things being rare is probably inaccurate.

The result of collecting specimens of some of the more conspicuous families during these two months may be of interest. Of Longicornia, 50 species of *Lamiidae* were taken in December, and 20 more added between January 11th–February 15th, most of the December insects having disappeared by then and were not again met with. The *Cerambycidae* were in more equal numbers during this period, 17 species in December, and 19 added in January and February, eight of them coming to the flowering-tree, *Vernonia arborea*. Another family which is well represented is the *Anthribidae*, 52 species and a great number of specimens, practically all on dead timber, very active and difficult to capture, dead branches generally impeding one's collecting. The *Curculionidae*, as usual, were very plentiful and apparently endless; I hope a few of these will help towards Dr. Sharp's estimate of 200,000 species for the whole world. I should not be surprised if Borneo produced 10,000 species. The three members of the genus *Apion* captured here all

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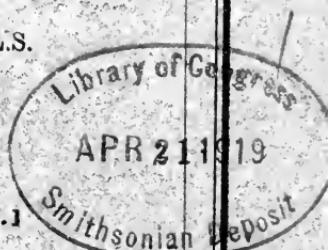
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MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—April 2nd, May 7th, June 4th, 1919.

The Chair will be taken at 8 o'clock in the evening precisely.

The Library is open daily from 9 a.m. to 6 p.m. (except on Saturdays, when it is closed at 2 p.m.), and until 10 p.m. on Meeting nights.

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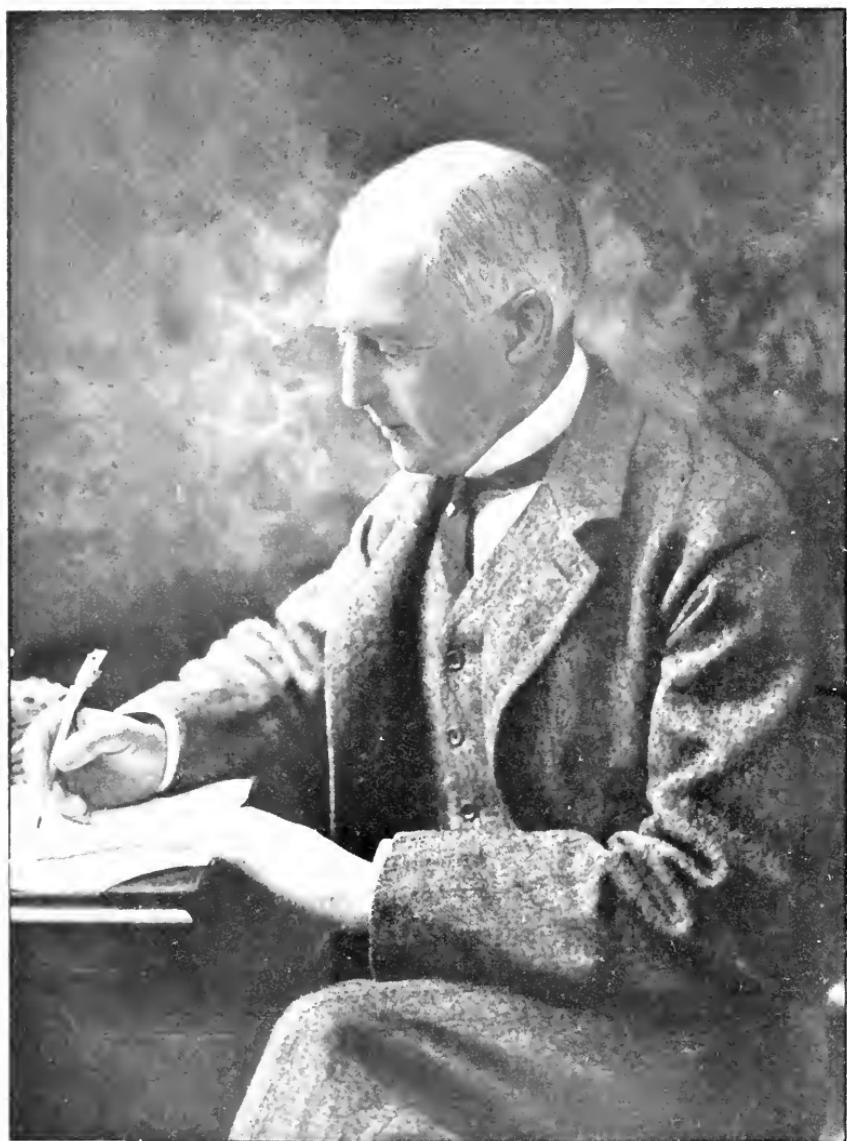
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ENT. MO. MAG., 1919. PLATE IV.



F. D. Godman

occurred at about 3000 feet, which is interesting, as they are so much better represented in the Temperate Region. Nearly all the *Carabidae* taken were found running on fallen trees, or under bark, or getting into crevices. The fine genus *Catascopus* gave me many anxious moments, their great eyes seemed to see everything that was going on. The terrestrial species are very scarce in the jungle country. The *Cicindelidae* are well represented on Matang, 11 species being taken in this short time: *C. aurulenta* F., common up to 1000 feet; *C. versicolor* McL., rather scarce here; *C. longipalpis* Horn, apparently rare, but very small and difficult to mark down, as it appears to love dark damp places, generally sitting on a wet mossy rock. *Dilatotarsa tricondyloides* Gestro, very rare in these months, only two being taken, in a very precipitous natural clearing made by a fallen giant. *Odontochela analis* F., very common from the foot up to 1000 feet. Four species of *Therates* were captured, all flying up from jungle-paths, and, as a rule, settling on ferns, between 1000-2000 feet seemed to be their chief haunt: *T. batesi* Thoms. and *T. errys* Bates, fairly common; *T. dimidiatus* Dej., very common; *T. spectabilis* Sch., apparently rare, as it is a fine, conspicuous insect; also five species of *Tricondyla* and *Collyris*, I took a great number of these later on at Quop as they seem to prefer the low ground. But *Tricondyla cyanea* Dej., subsp. *wallacei* Thoms., was most difficult to capture, as it always chose the largest tree-trunk to run up and dodge round; I found the best way to catch specimens was to dab my handkerchief upon them, as hard as I could, and they always came out undamaged. Twenty-four species of *Cleridae* were taken, all, with one exception, on dead timber, matching the bark most wonderfully.

During the wet weather, a great deal of time was spent in shaking dead leaves, etc., and examining Ants' and Termites' nests, which resulted in 70 species of *Pselaphidae* and many other things; and in bark-hunting, the stripped-off sheets of which concealed many Clavicornes and *Passolidae*. Cases of *Coleoptera* mimicking *Hymenoptera* are many. The small Cerambycid *Epaniu singapurensis* Thoms., when on the wing, is hard to pick out from a small black bee, *Melipona vidua* Lep., which haunts every clearing. I only captured sixteen specimens of the beetle and could have taken many thousands of the bee. Many species of the genus *Oberea* mimic *Braconidae*, and the rare *Nedytisis obreoides* Pase., when on the wing, could not be recognised as a beetle. A *Mordella* with hyaline elytra completely deceived me, when it was buzzing about in the net, and, as it was extremely active, I was afraid of being stung.

I left Matang on February 15th with great regret. What one might collect there in a few years would run into thousands of species: its marvellous vegetation, huge trees, wonderful pitcher-plants and ferns, its great drawback the lack of flowering trees in reach of a net and its greatest horror the leeches.

I spent a few days at Kuching and then left for Quop, where I was very fortunate to have the loan of a Mission Bungalow, close to a large Dayak house. This proved to be a very good collecting-centre, as there were several Dayak paths, leading out in different directions into patches of old jungle in low swampy country, and several steep hills dotted about still clothed with good jungle; there was also a good deal of second growth, useless to the entomologist and to be hurried through. All the good land had been cleared from time to time by the Dayaks for their paddi, as they farm in the most extravagant way, never growing paddi on the same piece of ground for more than one year, and then letting it revert to jungle for about fifteen years, so that the only ground that escapes the axe anywhere near a Dayak house is either too swampy or too steep; but anyhow they had left enough for me, as with hard work I added nearly 2000 species to my collection.

The Dayak roads here were very tricky and tiring to walk on, as they were Batang roads—that is, trees of various sizes felled through swampy jungle, and laid end to end for miles,—and they needed very careful walking on by a European in boots, as they were always very wet and greasy, the native with his bare feet having a great advantage. My best collecting-ground, Gunong Sibinis, was reached after a steady (or rather, unsteady) hour of doing the tight-rope on these trees. In many places they are raised several yards from the ground to avoid floods, and even then they get flooded in places, and to walk a flooded Batang road needed a lot of practice to do it in the correct style, to look at an insect was fatal. All the streams here were crossed by a single bamboo, sometimes with a shaky hand-rail, more often without.

Arrived at the foot of Gunong Sibinis, which appeared to be partly sandstone, there was a very steep slippery scramble to the summit, by hanging on to the roots and creepers. At the top, which was about 1000 feet, I got my Dayaks to make a clearing, which, after a few days, turned out most profitable, our best day's catch being 114 species of *Coleoptera*. Three days after the clearing was made we captured a great number of Longicorns of the family *Clytidae*, which were attracted by the dying foliage and timber—*Agylocrechus*, *Demonax*, *Perissus*, and *Chlorophorus*. Forty-three species of these were captured at

Quop, and sixty altogether, of which, I believe thirty-eight to be new. Some were attracted to flowering trees, which I was more successful in finding here. We could tell which trees were in flower high above our heads, without being able to see a flower, by the buzzing of insect-life. Whatever height the trees were the Dayaks would go to the top, climbing by the creepers and rattans; and they would cut off several huge limbs covered with blossom for me to stand by and capture whatever chanced to come; and they would stay up aloft and fill their bottles, by shaking the insects on the great sprays of blossom into their nets. The flowering trees which produced the most *Coleoptera* were *Vernonia arborea*, *Maesa* sp., two species of *Elaeocarpus*, and two species of *Eugeniu*. The chief visitors to these trees were *Cerambycidae*, *Elateridae*, *Cetoniidae*, *Curculionidae* (including 21 species of *Balaninus*, probably nearly all new), many small *Brenthidae*, *Helota* (a conspicuous genus of *Clavicornes*), *Halticidae*, and *Galerucidae*. Along the jungle-paths many beautiful members of the genus *Glenea* (*Lamiidae*) were met with, perhaps 35 species in all. Three specimens of the magnificent Cetoniid, *Diceros borneensis* Wallace, were captured as they were flying over mountain-tops, on three different occasions, and one fine ♂ of *Diceros peteli* Buquet, was taken in the same way, which shows the difficulty of taking a series of these active insects. The *Rutelidae* must also be numerous, but are equally hard to find, only seven species of *Parastasia* were taken—two were dug out of very rotten wood, *P. ephippium* Voll. and the other probably now, sp.; *P. 4-maculata* Wat. was captured on a flowering-tree, *Eugeniu* sp.; and *P. confluens* West., the commonest, came to light. It was on a jungle-path at Quop that I met with the remarkable Orthopteron, *Condylodera* sp. (not *C. tricondyloides* West., which I have taken in Java), a perfect mimic of *Tricondyla cyanipes* Esch., subsp. *cavifrons* Seh. I had a good look at it on a leaf by the side of the path, and thought it was the *Tricondyla* until I had it in the bottle; I took five specimens of the *Tricondyla*, which is probably a common insect, in the same place.

After leaving Quop I made a most interesting expedition with Major J. C. Moulton, who has written an account of it in the "Zoologist," 1914, pp. 361-374, 414-431, up the Sadong River, then to Mt. Merinjak near the Dutch border, and across country to the head-waters of the Sarawak River, and down to Kuching. The great majority of the *Coleoptera* taken at Merinjak were again new to me, which goes to show how every hill and mountain in a great island like Borneo must be thoroughly explored before we have any idea of the tremendous wealth of species the island will produce. Wallace during his stay in Borneo

spent nearly the whole of his time on the Sadong River, at Simunjan, and collected nearly 2000 species of *Coleoptera*, of which nearly 300 were Longicorns. During my short stay I obtained examples of approximately 3189 species, of which 369 were Longicorns, about 90 of these probably nov. spp. We must remember that Wallace was collecting practically all Orders, whereas I was specializing more or less:-

	No. of species.	Eucnemidae	44	Prionidae	2
Cicindelidae	42	Dascillidae	128	Lamiidae	208
Carabidae	90	Lycidae		Cerambycidae	159
Gyrinidae	2	Telephoridae, etc.,		Chrysomelidae:	
Tavicornia:		Heteromera	303	Criocerinae	
Staphylinidae	90	Copridae	52	Clytrinae	
Pselaphidae	104	Passalidae	15	Eumolpinae	
Seydmaenidae	38	Lucanidae	22	Chrysomelinac.	
Coccinellidae	34	Melolonthidae	53	Halticinae	90
Histeridae	10	Rutelidae	26	Galerucinae	220
Other families	228	Dynastidae	7	Hispaniae	34
Cleridae	67	Cetoniidae	56	Cassidinae	24
Buprestidae	91	Curenionidae	442		
Elateridae	110	Brenthidae	56		3189
		Anthribidae	158		

A few of the new forms have been described by G. J. Arrow, M. Cameron, G. C. Champion, and myself, in the "Trans. Ent. Soc. London," "Ann. and Mag. Nat. History," and the "Ent. Monthly Magazine."

Esher.

January 1919.

ON THE BRITISH SPECIES OF *DRYOPS*.

BY D. SHARP, M.A., F.R.S.

The following remarks on our species of *Parus* (now called *Dryops*) may be found useful as an addition to Fowler's Coleopt. Brit. Isl., vol vi, pp. 134-136. They are suggested by Signor Dodero's study of the European forms (Ann. Mus. Genova, xlvi, 1918, pp. 101-120, pl. ii). A series of our British species was sent by Mr. Champion and myself to Signor Dodero, and as Dodero refers to these specimens we have the certainty of what we are to understand from his study. He is one of the most competent and careful of the students of Micro-Coleoptera, and it is very satisfactory to find that his conclusions are quite the same as regards our British species as those I had previously reached. It is desirable to emphasise this, as Fowler's remarks might give rise to the idea that our species are very doubtful.

The three species *auriculatus*, *grisens*, and *anglicanus* form a

group apart from the others, as they exhibit a sexual dimorphism of the wings. In the female the apical portion of the wing is much abbreviated, though the organs appear to be quite suitable for flight. In the other species the wings are sexually homomorphic.

1. *Dryops auriculatus* (Fourer, ? nec Oliv.).—This species is readily distinguished from *D. liridus* by its more elongate form and the whitish sheen of its surface; it has a narrower, more convex head, and longer antennae with a paler shield. The aedeagus differs from that of all the other species, inasmuch as it is somewhat dilated at the junction of the basal and foreipital portions. I know of only two localities for it in this country, viz. Rammor near Brockenhurst (where it occurs in fair numbers, mixed with *D. liridus* and *D. striatellus*, in a small pond about eight yards in circumference), and Horning, in Norfolk, where it occurred in company with *D. anglicanus*. The locality "Sway," mentioned by Signor Dodero, is a mistake, the specimens I sent to him came from Rammor, which is about three miles from the Sway pits. When alive it may be picked out from the other species with ease and certainty by its white appearance and its shape.

According to Ganglbauer this is *Parans prolifericornis* Er., and he appears to have changed the name to *auriculatus* in deference to the statement of Des Gozis (Recherche, p. 9) that this is the *auriculatus* of Olivier. If Olivier's description goes for anything, Des Gozis was wrong; if the description does not go for anything, I do not know why Des Gozis should have changed the name. Ganglbauer gives Fourcroy as the first describer; the identifications of his species are notoriously doubtful. Hence this name, recently adopted, is no more certain than the one it has replaced.

2. *D. griseus* Er., Sturm, and Ganglbauer.—This insect is much broader than *auriculatus*, and is certainly distinct from it. The aedeagus is cylindrical and parallel-sided in its basal portion, the outline of the foreipital portion is almost triangular, and the point is very sharp.

D. griseus appears to be very rare in this country. I captured it many years ago at Hammersmith Marshes and at Morden, Surrey, both of which places have ceased to be entomological localities. I have also a beautiful male individual, for which I am indebted to Mr. Jas. Edwards, from Horning; and of recent years it has occurred in fair numbers at Sway and Holmsley, Hants. It is the *D. auriculatus* of Mr. Edwards's note in the Ent. Mo. Mag. 1908, p. 102. According to Dodero, the species is widely distributed in Europe and western Asia, where it extends as far as Samarcand.

3. *D. anglicanus* Edwards.—Dodero has seen only four examples of this species: three of them from England, and the fourth from an old collection with a wrong name, and the locality Caucasus, which he has no doubt is wrong. The species will, however, probably be found in the marshes about Lille; it is a fen insect, and has, since its original discovery, been found by Mr. C. J. C. Pool in the Cambridgeshire fens. It is a thoroughly separate species, though the external resemblance to both *auriculatus* and *griseus* is very great.

4. *D. luridus* Er., Sturm, Ganglbauer.—This species is flatter and shorter than the three preceding, and the outline of the head, seen directly from the front, easily distinguishes it from them: its predominant colour is brownish, not greyish, the shield of the antenna is black or blackish in colour, and the club of the antenna is blunter and shorter than in the two larger, grey forms.

This is the *prolifericornis* of most of our collections in this country, where it is one of the most abundant of our aquatic Coleoptera. It occurs all over England and Scotland, and is found in all sorts of waters, running and stagnant. In the New Forest it is in great profusion among the shingle near the edges of the water, and if this be pushed into the stream, the beetle rises, floats, and takes wing from the surface of the water in a charming manner—this, however, I have witnessed only in warm weather.

5. *D. striatellus* Fairm. (*algiricus* Ganglbauer).—This is very close to *D. luridus*, but is rather smaller and blacker, and though it has a greyish sheen when fresh it never exhibits the brown colour of *D. luridus*. The antennae are shorter than in *luridus*. The aedeagus is more slender, and its apical part comparatively more elongate. The species usually has the striation of the elytra more distinct, but this character is a very variable one in the genus, and should not be much relied on.

D. striatellus is abundant in the New Forest and at Woking, but I have not seen it from any locality north of the Thames. Dodero gives four French localities only for *striatellus*. *D. algiricus* is another species.

6. *D. nitidulus* Heer, Sturm, Ganglbauer.—Easily distinguished from *D. ernesti* by the more approximate antennae. I have seen but few British examples and they vary so much that I think it possible there may be more than one species among them. Dodero gives localities in France, Italy, and Austria for the species, as well as Freshfield in Lancashire. His figure of the aedeagus does not agree satisfactorily with our British examples, and a further study of our forms is desirable.

7. *D. crnesti* Des Gozis, Ganglbauer.—Distinguished from all the other species by the widely separated antennae. This is the *auriculatus* of our old collections, and it is a great pity that the name has been changed by Des Gozis on account of his belief that the *D. auriculatus* of Olivier was another species. *D. crnesti* is fairly common in Scotland, but the few English examples I have seen are inadequate for me to decide whether there may not be more than one species among them.

I may mention that *D. lutulentus* Er. was included as British in the catalogue of Fowler and Matthews. I do not know on what grounds. It is probable that we have one or two other species in addition to those here enumerated, but I have never seen any British example of *D. lutulentus*.

Brockenhurst.

March 11th, 1919.

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TWENTY-FIVE YEARS IN SOUTH DEVON. A LEPIDOPTERIST'S
RETROSPECT.

BY C. M. MAYOR.

(Concluded from p. 32.)

Leucania ritellina.—Our first specimen of this delicate and attractive moth came to sugar on August 18th, 1899, and was soon followed up by several more. In the following year it was a month later, but far more numerous, as we sometimes got seven or eight per night. In subsequent years it generally put in an appearance during September or October. *L. ritellina* is very skittish at sugar, with its wings all tremble, and wants quickly boxing or will likely enough be gone in a flash. In this respect it is very different from

Laphygma exigua, which sits sluggish and quiet and may be examined leisurely by lantern-light. My first introduction to this interesting species was in the second week of August 1897, when three specimens were discovered amongst a heap of commoner moths taken for me by a friend. In 1898, *exigua* seems to have been absent, but in 1899 it again put in an appearance, and I got three more in the first week of September, all at sugar and in the same district. 1900, however, was an *exigua* year. In the latter half of September and throughout October quite a considerable number occurred, sometimes as many as fifteen in an evening. I think not far short of one hundred were taken by myself and friends. The autumn of the year in question was, as stated before, remarkable for the success of sugaring. The

majority of the examples of *exigua* were not quite perfect; but some, on the other hand, were large and in fine condition. In 1901 the species did not turn up, and in 1902 only one worn female was seen. The year 1903 is described in our Diary as probably the worst autumn for collecting ever experienced. Heavy winds and pouring rain succeeded each other in monotonous procession. We did not meet with *exigua* again until 1906, when it turned up in numbers that fairly staggered us. If 1900 had been a good year for it, 1906 was a far better one. It appeared, too, very suddenly, as up to September 3rd not a specimen had been seen. Two nights later no less than thirty-two were taken, and this number was exceeded afterwards, *exigua* continuing very much in evidence until the middle of October. We have no record for 1907 or 1908. Some friends have been very successful in breeding it from ova deposited by captured females, and have obtained a second and, I rather think, even a third generation, which, however, showed signs of degeneration.

Stilbia anomala occurred, but very locally, having been taken fairly commonly only in one spot on the wing at dusk and also at sugar. I have seen it at rest, probably freshly emerged, hanging to the wires of a fence upon which we used to put our sugar.

All attempts to find *Heliophobus hispidus* failed, though this beautiful insect occurred plentifully a few miles away, and I have bred many of them from larvae taken in the latter locality.

Heliothis peltigera.—Though I suppose this would be considered a more plentiful insect than *H. armigera*, we never met with it in any stage until August 1897, when I captured a beautiful and freshly emerged specimen at sugared flowers of *Rudbeckia* in my garden, on a rather cold and brilliantly clear night. The year 1906 turned out to be a great *peltigera* year. We started by taking them at flowers of *Silene maritima* on May 31st whilst after *Dilephila livornica*, of which latter we were fortunate in getting two that evening and several more during the next few days. Early in July we found numbers of *peltigera* larvae on plants of rest-harrow growing on the coast; these fed up and began emerging on August 11th. Towards the end of the month *peltigera* came freely to sugar and we took our last specimen on October 3rd,—the last for the year and also the last we saw, as I can find no note of its having occurred with us since.

H. armigera is far more constant in our neighbourhood than the preceding species though never numerous. First taken at the end of August, 1898. In September the year following I got as many as five in a single evening—quite my record! In 1900 a few. Six in 1901.

The next two years we did not meet with *armigera* at all; but it has turned up several times since then. All taken at sugar. I have in vain sacrificed beautiful full-bodied females of this moth for ova, which were freely deposited, but never proved fertile.

I must say a few words about *Caradrina ambigua*, because some years ago this moth was one of the chief attractions to collectors visiting Devon. We first took it in or about the year 1894, but, unfortunately for us, failed to recognize it. In those days *ambigua* seems to have been not very well known, as we sent specimens of it to an authority who returned them as *blonda*! Our first two examples were taken on a street-lamp immediately in front of my house, but, though we were doubtful about their identity, it was not until 1896 that they were picked out for us by Mr. G. T. Porritt, who immediately detected them amongst some other *Caradrinas* we had sent him. In 1897 *ambigua* swarmed on the coast. We took over three hundred at sugar in August that year, and the demand for exchange purposes was so great that we could easily enough have disposed of double the number. Though it has occurred, probably, every year since, I have never found *ambigua* so plentiful again, and, indeed, in some years it has been almost scarce. This moth besides being attracted by sugar and light, comes to Ivy bloom, on which I have often found late specimens in October.

Lithosia caniola.—No account of Devonshire insects would be complete without reference to this delicate and local little "Footman." When we first discovered it in 1895, *caniola* was quite a stranger to us, and it took us several years to find its headquarters. I remember being in Torquay one August in the "nineties" and, going out for a walk on Hope's Nose in the evening, I encountered a party of collectors who, after having sugared the district extensively, were trying for *caniola* down the cliff-sides with long-handled nets. This set me thinking, and upon returning to my own town, I determined to seek *caniola* in some such situations. Eventually I discovered a cove by the sea where this moth turned out to be in strength, and for many years afterwards—indeed, so long as I continued to look for it—it never failed to be present there generally as strong as, or stronger than, ever, in spite of persistent collecting. If I were at home I never failed to visit this cove on or about July 11th, as weather conditions seemed little to affect the time of appearance. From that date until the middle of August one could generally obtain *caniola* on the wing at dusk in the immediate vicinity of the cove.

In 1899 we caught about 60; but in 1903, which was a good year

for coast species, this moth was specially abundant and we had no difficulty in obtaining 30 in an evening, either on the wing or at rest on grass-stalks. So far as we could tell, *caniola* was practically confined to this cove. I do not mean to say that we never got it any distance away, because I have taken specimens from street-lamps half a mile from the sea, and also odd ones up and down the coast. But it is very local. Large numbers of larvae were taken in the spring without apparently having much effect in reducing the subsequent numbers of the perfect insect. In a letter I have before me from the late Mr. G. C. Bignell, he wrote that he took larvae of *caniola* on Bolthead, Devon, so long ago as 1872.

Sphinx convolvuli.—This fine insect visits us during the autumn, sometimes in considerable numbers, though certainly not every year. I made two very large cyanide jars specially for *convolvuli*, and on several occasions have caught them in such quick succession that both jars had to be employed. Each season I usually grew a big bed of *Nicotiana affinis* for the particular delectation of these monsters, and they were very kind in showing their appreciation. In 1901 I took quite a number, including some very perfect and beautiful specimens. In our garden was a large viney, and several self-sown plants of tobacco had come into flower there. By leaving all the windows and doors open at night I found that *convolvuli* was attracted inside and easily seened at rest on the woodwork in the early morning.

I recollect once reading that *S. ligustris* (with us quite one of the commonest of the hawk-moths) did not visit *Nicotiana* flowers like *convolvuli*. This, however, is quite a mistake, and probably arose from the fact that the tobacco is not usually in bloom early enough for *ligustris*. One year I grew a big batch of this plant under glass, and with heavy doses of artificial stimulants they made magnificent heads of blooms. To make room for other things I turned them all out of doors while still in flower, and watched in the evening to see whether they were visited by any insects. *S. ligustris* came in numbers, and it was a pretty sight to watch them bending down the long thin stalks of the plants, from which I had taken the supporting sticks.

Callimorpha dominula.—Twenty years ago a very strong colony of this exotic-looking moth existed in a cove in our cliffs. The larvae were usually in great abundance in the spring, and I have taken a hundred in quite a few minutes by cautiously climbing down the steep cliff-sides. Care was necessary, as a fall might result in a watery grave in the sea below. How gorgeous, later on, were the moths, flying about in the hottest sunshine! Unfortunately, collectors from other places got to hear of the presence of *dominula* there, with the result that it has been

all but exterminated. I have tried the larvae on several foods, but none is eaten with such avidity as *Anchusa sempervirens*. It seems peculiar that this species never, so far as I know, strayed from the small cove in which it had been established so many years. One might suppose that adjoining and similar situations would have suited it equally well. But such was apparently not the case.

It will be noticed that I have omitted all mention of butterflies in this paper. There are two reasons for this omission: first, because I was usually busy during the daytime with my own work and thus had little time to give them; second, that though my friend was a man of leisure and *did* make excursions after butterflies, when I occasionally accompanied him, we never met with anything of sufficient interest to record from our neighbourhood. I must mention, however, one exception. In the year 1898 an artist friend was out sketching one day and noticed an abundance of some Fritillary that was flying about near him. Knowing I was interested in the subject, he told me about this, with the result that we went in search and soon discovered a very strong brood of *Melitaea athalia*. They were positively in hundreds, and we captured as many as we wanted—rather a lot, I fear. Since then *athalia* has been taken in the same spot, but never in the numbers that appeared in 1898.

Space will not permit any detailed reference to many other interesting species. Indeed, an account of twenty-five years' collecting in any one place would easily fill a small volume. No reference either has been made to "dusking" for *Geometræ*, at which my friend was very successful, or to pupa-digging, which I pursued with satisfactory results during the dead months for some years. Ivy-bloom has also been omitted, as, with few exceptions, we found that most of the frequenters of this flower also came to sugar, and were far more easily taken thus.

Bank House, Dawlish, S. Devon.

October 1918.

THE LARVA AND PUPA OF *TAENIORHYNCHUS RICHARDII* FIC.
(DIPTERA, CULICIDAE).

BY F. W. EDWARDS, B.A., F.E.S.

Mosquito-larvae of the genera *Taeniorhynchus* (*Mansonia*) and *Mansonioides* have now been known for some time from North and South America and West Africa, but up to the present the early stages of the European species (*T. richardii*) have not been described.

I am now able to state that the larvae of this species have the same remarkable structure and habits as the North American *T. perturbans* Wlk., *i.e.* they live among the roots of water-grasses, from which they obtain their supply of air by the aid of a highly modified spiracular apparatus.

The larva of *T. perturbans* was well described and figured, and its habits largely elucidated by J. B. Smith; all who may be interested should consult his paper (Ent. News, xix, 1908, p. 22), and that by Grossbeck on the pupa in the same volume (p. 473); also the condensed account in Howard, Dyar, and Knab's "Monograph of the Mosquitoes of North America" (vol. iii, part 1, p. 508). The early stages of *T. richardii* prove to be so nearly identical with those of *T. perturbans* that by comparing specimens of the former with figures and descriptions of the latter I have been unable to discover any points of difference.* Any detailed description of *T. richardii* would therefore be superfluous; nevertheless several points have come under my notice with regard to our British species which have apparently been overlooked by earlier writers and yet seem worthy of being placed on record.

T. richardii abounds, in the winged state, round a pond near my house at Letchworth, Herts, during June and July; males and females, the former greatly preponderating in numbers, hovering among bulrushes and grasses round the water's edge. After a number of fruitless attempts, I succeeded in obtaining about a dozen full-grown larvae, in June 1918, by pulling up some of the water-grass (*Glyceria fluitans*) and shaking out the roots into a white dish. The *Typha* roots, as well as roots of other water-plants, were examined in the same way, but never yielded any larvae. Later, in November 1918, a few half-grown larvae were found among the roots of *Glyceria*,† so that it may be presumed that, as in the case of *T. perturbans*, our British species spends the winter in the larval state; probably there is only one generation in the year.

A number of the larvae were kept under observation in small glass bottles containing some *Glyceria* roots, to which they could be observed to attach themselves. They would remain for long periods attached in one spot, but nevertheless made frequent moves. Occasionally, especially when disturbed, they would rise to the surface of the water and hang suspended there in the manner of an ordinary mosquito larva. Whether they would ever do this in nature, and whether they could obtain atmospheric air by this means, may be doubted.

* It would be quite reasonable to regard these two forms as geographical races rather than as true species, since the male genitalia, as well as the larvae and pupae, appear to be identical in structure. The two can, however, be sharply separated by the coloration of the hind legs.

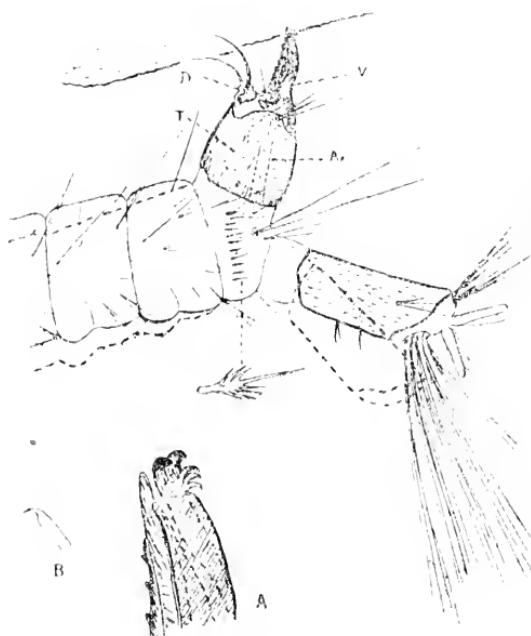
† One of these specimens lived without moulting until January 10th.

It was possible to observe in some detail, under a strong lens, the movements by which the larva effected its attachment to the grass-roots : these are perhaps worth describing, but in order to do so it will be necessary to give some account of the structure of the breathing-tube. This organ is shorter than in most other culicine mosquitoes, and far more complex. It consists of broader basal portion (corresponding to the air-tube of *Culex*) and a narrower, black apical portion. This latter is quite obviously homologous with the valvular closing apparatus of the ordinary culicine larva, though this fact does not appear to have been recognized by previous writers on this group of mosquitoes. In *Taeniorhynchus* the dorsal pair of valves (always smaller than the ventral) is considerably reduced in size, but the stout curved bristle which they carry is, on the other hand, very strongly developed. The ventral pair of valves are large and elongate, and form the black apical portion of the air-tube ; they are joined together by membrane, and in this way are modified to form an immovable sheath for the protection and support of the complex internal organs. These last comprise a flat piece with a saw-like dorsal keel, and a pair of sharply pointed pieces on either side of it, attached to the end of the common hollow space formed by the conjoined tracheal tubes : also a pair of more ventrally placed pieces, each with two very strongly chitinized hooks at the tip, hinged on to a stout axial rod, which again is fixed to the junction of the tracheal tubes. Finally, there are three pairs of sharp hooks in the membrane at the apex of the ventral valves.

The breathing-tube of *Mansonioides africanus*, well described and figured by Ingram and Scott Macfie (Bull. Entom. Research, viii, 1917, pp. 137-140), has a closely similar structure, only differing in certain minor details, such as the general shape of the air-tube and of the ventral valves, and the number of teeth in the saw (about 14 instead of about 7).

When the larva approaches a rootlet with the object of affixing itself, which it does tail-foremost, the first movement which can be observed is that the strong bristles on the ventral valves are waved about, and their sharp tips inserted into the spot chosen. Doubtless, as suggested by Ingram and Macfie, these bristles are sensory, and may "transmit a stimulus enjoining the larvae to attach themselves." The tips of the ventral valves are then brought into contact with the root, and the three pairs of hooks, which are normally inside the tips of the valves, are everted. These hooks are directed posteriorly, the points of the stout bristles anteriorly, so that between them they can obviously afford the larva a tolerably firm preliminary "foothold." The hooks, it should be said, act quite independently of the other internal structures.

The larva then commences a series of violent jerks; the body, at first held in a curved position, is suddenly straightened out (without being lengthened), and at the same moment the anal segment is bent rapidly downwards. The first position is then more slowly resumed, and after a brief moment of rest the movement is repeated; this continues until the tip of the air-tube is firmly embedded in the grass root. The position immediately after the jerking movement is indicated in the



End of abdomen of larva of *Taeniorhynchus richardii* to show method of attachment to *Glyceria* roots. (Considerably diagrammatic.)

D, dorsal (or anterior) valves, bearing stout curved bristles: V, ventral (or posterior) valves forming a sheath for the saw; T, main tracheal trunks; Ax, axial rod; A, extreme tip of breathing-tube further enlarged, to show three pairs of hooks in the membrane, and the two strong black hooks at the tip of one of the internal pieces; B, tip of the stout bristle on the dorsal valves enlarged to same scale as A.

figure by dotted lines, but the anal segment should have been shown as having moved considerably further. The effect of this movement is probably to force the contents of the air-tube, including the whole of the apparatus at the end of the tracheal tubes, outwards.

During or immediately after the jerk the axial rod can be seen to sway to and fro. This action probably has the effect of "approximating the terminal elements, so as to form a sharply-pointed cone for thrusting into the root," a function which was suggested for the axial rod by

Ingram and Maetje. Perhaps also the muscles producing the deflection of the anal segment may be attached to the swollen end of the axial rod, but this I have not been able to observe.

T. richiardii has another remarkable adaptation, apart from those found in the air-tube, which has not been previously observed, though it may be expected to occur in the other species of the group. This is the presence in the thorax of a pair of large air-sacs, formed by dilatations of the small tracheal branches which arise from the main trunks in the first abdominal segment and project forwards into the thorax. No trace of any such dilatations can be seen in any other British mosquito larva, and they are not indicated in the published figures of any American species. They can only be compared with the thoracic air-sacs of *Chaoborus (Corethra)* and *Mochlonyx*, though it is unlikely that they are the same either in origin or function. I think there can be little doubt that the air-sacs of *Taeniorhynchus* act as storehouses for the oxygen which is obtained with so much difficulty; perhaps they may be necessary for hibernation, since there can only be a very slight gaseous circulation in the grass roots during the winter.

The pupa of *Taeniorhynchus*, like the larva, is adapted to a subaqueous existence, the tips of the breathing-trumpets being drawn out into sharply pointed processes which are inserted into the grass roots. Although I have not found a living pupa, and all my larvae died before pupating, a balsam mount of one specimen shows the pupal breathing-tubes very clearly. The terminal portion, which is presumably inserted into the root, has a beautiful structure, being finely ridged or barbed, somewhat like a feather, the tip corresponding to the feather's base.

The mode of emergence of the adult *T. perturbans* has not been made known, and it will therefore be of interest to record that several specimens of *T. richiardii* hatched out in a pail which I had brought home with pond-water and sods of the grass. The empty pupal skins were found floating on the surface of the water, and the pupae must therefore have risen to the surface for the emergence of the adult. An examination of these skins showed that in every case the terminal portions of the breathing-tubes were missing, hence it must be inferred that they had been left behind in the roots. Most likely their barbed structure, while facilitating their insertion, would prevent their being withdrawn. There seems to be a line of weakness at the base of the barbed portion which might render its detachment easy.

In conclusion, it may be briefly mentioned that several other Dipterous larvae were found in the same conditions as *T. richiardii*,

some of them showing interesting spiracular modifications for obtaining their air from the *Glyceria* roots. These larvae include a *Notiphila*, an Eristaline, and an *Erioptera*; they are being investigated by Dr. D. Keillen.

56 Norton Road, Letchworth.

February 1919.

Secondary sexual character of Gibbium scotius F.—Having had a number of living *Gibbium* handed to me for my collection by Mr. Potter, I carefully examined them in the hope of discovering a character whereby they could be readily sexed without the necessity of dissecting out the genitalia, and to my satisfaction found that the male has a long upright tubercle on the metasternum between the posterior coxae: in the female this is only very slightly indicated, so that they can be quite easily separated by examining the metasternum. This character was verified in half-a-dozen different specimens by dissecting out the genitalia.—H. BRITTON, 22 Birch Grove, Levenshulme, Manchester: March 7th, 1919.

Diabrotica soror Lee, in Glamorganshire.—I took an example of this North American insect crawling on some sand-hills near the sea at Gower in April 1918. This Galerucid beetle is known in the U.S.A. as a pest on maize. I am much indebted to Dr. Gahan for identifying the species.—H. E. DAVIS, Yscallog, Llandaff, Glamorgan: March 15th, 1919.

Notes on the occurrence of some Ptinidae and Dermestidae in old cotton-mills at Droylsden, near Manchester.—

Ptinus tectus Boield.—One specimen taken in August 1917, in mill.

Niptus hololeucus Fall.—Found in a house at Droylsden in abundance during 1917 and 1918. Specimens were frequently seen in the pantry after nightfall, as they came out foraging, the insect retiring as the light approached into little chinks under the shelves and nail-holes. Two examples taken in mill.

Trigonogenius globulum Sol.—Eleven specimens, four of which were found dead in the fire-buckets, the remainder I took by making little traps of sugar which proved an attraction for them. The dates of capture are as follows: one specimen, June 1917, one on July 15th, 1918, the remainder in January and February, 1919.

Gibbium scotius F.—On March 9th, 1918, on ripping off a piece of fluff from the wall, an insect was discovered which looked like a small spider; this, however, on unfolding its legs, showed itself to be a beetle. On May 20th, 1918, a second example was found, creeping on the wall. On January 19th, 1919, I found one dead in a fire-bucket, and on January 21st two more, this convincing me that they occurred somewhere else in the mill, and that those I had already found were only stray ones. I therefore sought and obtained permission to visit the mill when the machinery was stopped. On February 2nd, 1919, I went in and succeeded in finding the colony. It is evidently a warmth-loving

insect, the place they had selected being about eight yards from an upright steam-pipe; here, amongst bits of bread, scraps of bacon, tea-leaves, and abundance of grains of sugar. I captured 22 specimens, subsequently bringing the total to over 100 living and 12 dead ones. I also found the pupa-cases, which are of a papery texture.

Dermestes rufipennis F.—Eleven males and three females, taken on various occasions. The cast skins of the larva are frequently found. The dates of capture are as follows: one specimen, 9.iii.1918, another, 20.v.1918, the remainder, January and February, 1919.

Attagenus pellio L.—One specimen found creeping on a wall, March 8th, 1918. — W. POTTER, 5 Buller St., Droylsden, Manchester: *March 12th, 1919.*

Notes on Derbidae in the British Museum Collection, II: a correction.—In the "Entomologists' Monthly Magazine" for November 1918, on page 243, line 6, the following corrections should be made: for "The genera *Kermesia* Dist., *Alara* Dist., *Inewala* Dist.," read "The genera *Kermesia* Melich., *Phaeocnemis* Kirk., *Inewala* Dist." This group also includes *Puranisia* Mats. and *Eponisia* Mats.—F. MUIR, Honolulu, T.H.: *January 22nd, 1919.*

Hibernating Andrenas.—On October 20th, 1918, I dug out of a sandy bank at Market Bosworth, Leicestershire, where *Andrena clarkella* burrows had been observed in the spring, a number of both sexes of that insect. Again, on October 23rd, at Peckleton, in the same county, I unearthed more of the same species. On October 31st, at the Outwoods, Atherstone, Warwickshire, I dug up numerous examples of *Andrena cingulata*, both ♂ and ♀. In all cases the bees were in perfect condition, contained in the larval cells, and there was no trace of larvae. Since F. Smith states that *Andrenas* pass the winter in the larval state, it would be interesting to know to what extent he is incorrect. Saunders gives instances of *Andrena cineraria*, *A. fulva*, and *A. nigroaenea* having been dug up in December, and the spring species might be expected to mature early; but *A. cingulata* is a midsummer insect, and it seems remarkable that it should reach maturity in the autumn of the year previous to emergence.—L. A. Box, 80 Northampton Road, Croydon: *March 4th, 1919.*

Obituary.

Frederick DutCane Godman, D.C.L., F.R.S., etc., third son of Joseph Godman of Park Hatch, Godalming, Surrey, died on February 19th at his London residence, 45 Pont Street, S.W., in his 86th year, and was buried at Cowfold, not far from his Sussex home at South Lodge, Lower Beeding, on February 24th. Long accounts of his life and untiring activity as a Traveller, Field Naturalist, Ornithologist, Entomologist, Sportsman, etc., have been published in the Jubilee Supplement to the "Ibis" (1908, pp. 81–92), and in the Introductory Volume of the "Biologia Centrali-Americana" (1915), to which, in this necessarily restricted notice, we are able to add some particulars as to his entomological work. He was born at Park Hatch on January 15th, 1834, and educated at Eton and Trinity College, Cambridge, where, in 1853, he made the acquaintance of the two brothers Newton and of Osbert Salvin, all three of

them having a great love for Natural History, particularly Ornithology. His close and life-long friendship with Salvin, terminating only with the death of the latter in 1898, resulted in the initiation and subsequent publication of the "Biologia," of which they were the joint Editors. This stupendous illustrated work on the Natural History of a portion of Tropical America, certainly the largest undertaking of the kind that has hitherto been published, the Zoology alone extending to 52 volumes, of which no fewer than 38 are devoted to the Insecta, was commenced in 1879 and finished in 1915. The volumes dealing with the Aves and Rhopalocera were undertaken by the Editors themselves, and as regards the Rhopalocera they were the first entomologists to study and figure the ♂ genital armature of the extremely numerous and perplexing Central American *Hesperiidae*, 34 plates being devoted to these alone in the "Biologia." The present writer was employed on this great enterprise from its initiation, and for upwards of four years he travelled in Guatemala and the State of Panama, collecting material for it, subsequently acting as sub-editor till the work was concluded. He owes his career as an entomologist entirely to the encouragement, liberality, and friendship with Godman, with whom he remained in close association in his natural history work for forty years. It is a matter for sincere congratulation that Godman lived to see the finish of this great book, the work of carrying it on for seventeen years after Salvin's death having been extremely onerous. His other work on Entomology, mostly written in conjunction with Salvin and published in the Proceedings of the Zoological and other Societies, deals mainly with Tropical American Rhopalocera, the first paper being dated 1868, and the last, by himself alone, 1907, both contributed to the "Annals and Magazine of Natural History," and it may be noted here that in the first article in Vol. I of the "Entomologist's Monthly Magazine" (June 1864) H. W. Bates described various new butterflies captured by them in Central America. In 1861 the two Editors of the "Biologia" made a joint expedition to British Honduras and Guatemala, and long afterwards, in 1888, Godman visited Mexico alone, the results of these journeys contributing largely to the material for their book, 425 species of Rhopalocera having been taken by one or other of them in Guatemala and Panama. In 1865 Godman made a voyage to the Azores, taking with him a well-known Coleopterist, J. A. Brewer, and in 1870 published in an octavo volume a detailed account of the Flora and Fauna of those interesting Oceanic islands. The 212 species of beetles recorded from there, all named by G. R. Crotch, were subsequently handed over to the British Museum. In 1879 Godman made a collecting-trip to the French, Italian, and Swiss Alps, in company with O. Salvin, H. J. Elwes, and W. A. Forbes, the last-named entomologist contributing a paper on the subject to this Magazine in April 1880, entitled "Three weeks' collecting in the Alps," in which 103 species of butterflies were stated to have been captured.

Godman was a Fellow of the Royal, Linnean, Zoological, and many other Societies, and Treasurer to the Ray Society for some years, and in 1891 and 1892 he was President of the Entomological Society of London, his Fellowship dating back to 1865. As recently as May last he was awarded the Gold Medal of the Linnean Society for his "Services to the Science of Natural History." The whole of his zoological collections were presented to the British Museum, of which, in 1896, he became a Trustee. The Janson collection of

Elateridae (including that of Candèze), acquired for the study of the Central American forms, was also given by him to that Institution.

Godman will need no other memorial than the "Biologia." Yet though he gave himself heart and soul to this great work, sparing no labour or expense in its production, he was no literary recluse or mere hobby-rider. His greatest wish was to foster the love of knowledge, and the value of scientific training was ever present to his mind. Natural Science, not alone Zoology, was the dominating influence of his life, and his receptive well-balanced mind coupled with an extraordinary power of observation enabled him to acquire a breadth of knowledge given to few. He was the least ostentatious of men: in evidence of this it may here be stated that his many gifts made in the interest of science were invariably without restriction or stipulation as to the association of his name in connection with them. Apart from the great value of these donations to the Museum, their scientific worth was enormously enhanced by being incorporated in the classified collections, a work which has been carried out—partly at his own expense—over a long period of years. His help was ever unobtrusively given and his sympathetic interest in the lives of others will cause his memory to be held in affectionate remembrance. In truth, Godman was one of those of whom it may be said—"He prayeth well who loveth well, both man and bird and beast." He married in 1872 Edith Mary Elwes of Colesborne, Cheltenham, who died in 1875, and, in 1891, Alice Mary Chaplin, leaving two daughters by the second wife. In the dedication to the "Introductory Volume" of the "Biologia" he acknowledges the great assistance and sympathy given him by his wife, now Dame Alice Godman, in the completion of the work. The portrait accompanying this notice is reproduced from a photograph taken by Van Dyck about 1907.—G. C. C.

William Denison Roebuck.—By the death of William Denison Roebuck, at the age of 68, which took place on February 15th last, Yorkshire has lost one of its best and most prominent naturalists; and by not many will his loss be felt more than by the writer of this notice, who was closely associated with him for forty or more years in Natural History work.

Although best known as a Conchologist—he was a high authority on Limacology,—Roebuck from his youth took a very great interest in insects, and few have done more for Entomological Science in Yorkshire than he. At one time he was greatly interested in British *Hymenoptera*, and was responsible for the list of that group in the Victoria History of Yorkshire, as he also was for the entire Entomological chapters in the Victoria Histories of some of the other northern counties of England.

He was rarely, if ever, absent from the meetings—even committee meetings—of the Entomological Section of the Yorkshire Naturalists' Union, and only at the Annual Meeting of the Section in October last undertook to compile for publication a list of the *Hemiptera* of the county. For a great part of his life he had kept records, with references, of all the papers and notes, not only to all orders of insects, but to all the other branches of natural history referring to Yorkshire and adjoining counties—when he could do so, cutting-out the papers and notes themselves, and filing those of the various authors separately. He was thus able at any moment to turn to any information

wanted on any subject connected with North of England Natural History, which had been published since any interest whatever has been taken in natural science in these counties. His help to science in this way has been incalculable. He was personally known to almost every naturalist in Yorkshire and Lincolnshire, and probably but few of them were unfamiliar with his characteristic, clear, bold handwriting.

As he was fortunately possessed with sufficient of this world's goods to enable him to live comfortably without profession or business, he was able to devote the whole of his time to congenial pursuits, and by far the most of it was spent in the furtherance of Natural Science. His favourite hobby was undoubtedly the Yorkshire Naturalists' Union, and from the time of his first connection with it, when he was quite young, his work on its behalf was untiring and indefatigable. It was on his suggestion that the Union, very many years ago, adopted the system of the British Association of working the different departments in "Sections," which has proved so successful ever since. For nearly thirty years he was its honorary secretary, and, besides doing all the ordinary detail work, edited its "Transactions" and saw through the press many of the important works on the Fauna and Flora of the County which it has published. For eighteen years (1884 to 1902) he edited the "Naturalist," part of the time in co-operation with Dr. W. Eagle Clarke; and also was author, in conjunction with Dr. Clarke, of "The Vertebrate Fauna of Yorkshire," published in 1881. Besides the Y. N. U., he was interested in many other Scientific Associations. He had been a Fellow of the Linnean Society since 1884, and had been President of the Yorkshire Naturalists' Union, and also of the Lincolnshire Naturalists' Union.

Born at Leeds, he resided there all his life, with the exception of a short period of his youth, when he lived at Pannal, near Harrogate. His remains were cremated at Lawnswood Cemetery, Leeds, on February 19th, the service being attended by many members of the Yorkshire Naturalists' Union and other Societies.—G. T. P.

ON THE ALIMENTARY CANAL AND ITS APPENDAGES IN THE
LARVAE OF SCATOPSIDAE AND BIBIONIDAE (DIPTERA NEMA-
TOCERA), WITH SOME REMARKS ON THE PARASITES OF THESE
LARVAE.

BY D. KEILIN, SC.D.

(from the Quick Laboratory, University of Cambridge).

The external morphology of the larva of *Scatopse notata* was first described and figured by Perris in 1847, and the detailed structure of the head, mouth-parts, and spiracles was recently given by de Meijere (1916) and by Morris (1918). The internal organs of this larva, and especially its digestive system, have not hitherto received attention.

The structure of the alimentary canal of this larva is as follows:—(Fig. 1.) The oesophagus (*Oe.*) is very short and ends in the proventriculus (*Pr.*) or oesophageal valve; the latter joins with the mid-gut

(*m.g.*), which forms a straight tube, narrowing slightly posteriorly, and ending in the posterior part of the body. From the anterior portion of the mid-gut, close to the proventriculus, arise two very long lateral caeca (*a.c.*) which run backwards and are closely apposed to both sides of the mid-gut. The surfaces of these caeca show a series of deep transverse folds. Two other lateral caeca arise from the posterior portion of the mid-gut, some distance in front of the Malpighian tubes. These

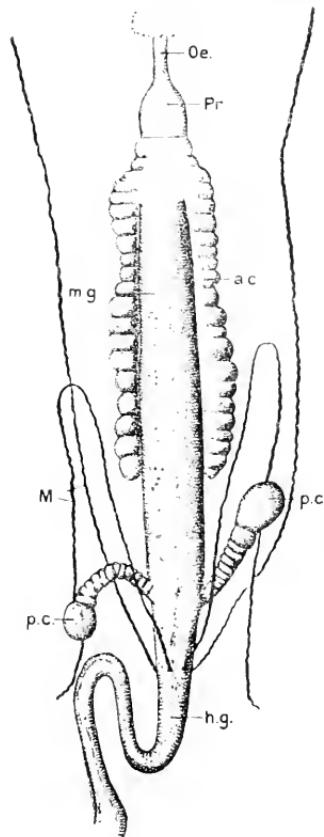


Fig. 1.—Alimentary canal of the larva of *Scatopse notata*: *Oe.*, oesophagus; *Pr.*, proventriculus; *a.c.*, anterior lateral caeca; *m.g.*, mid-gut; *p.c.*, posterior caeca; *M.*, Malpighian tubes; *h.g.*, hind-gut.

posterior lateral caeca (*p.c.*) are directed forwards and are not fixed to the mid-gut along their lateral borders; they are shorter than the anterior caeca, and also show the transverse folds, especially in their basal portions.

The four strongly-pigmented Malpighian tubes (*M.*) arise separately at the junction of the mid- and hind-gut. The latter (*h.g.*), after making a short bend forward and then backward, ends in the anus.

I have found a similar structure of the alimentary canal in two other larvae of *Scatopsidae*—*Scatopse* sp. and *S. (Ectaetia) claripes* Lw.

The alimentary system of the Bibionid larvae comprises two different types, that of *Bibio hortulanus* L. being the simpler. It shows

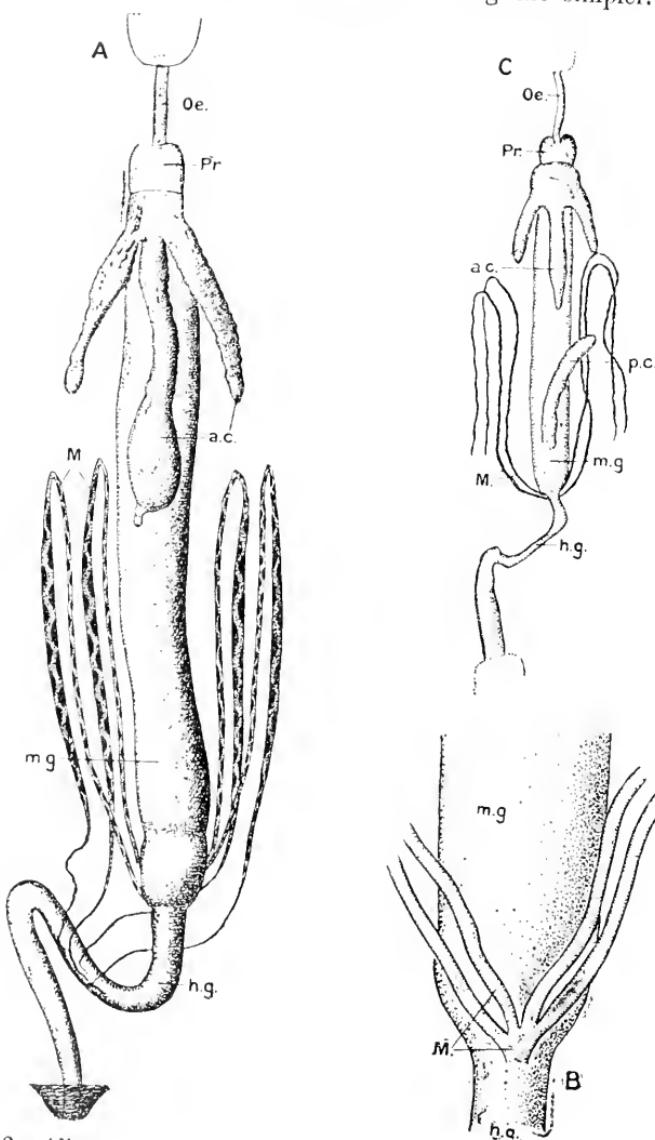


Fig. 2.—Alimentary canal of Bibionid larvae: A and B, *Bibio hortulanus*; C, *Dilophus febrilis*. Letters as in fig. 1.

(fig. 2, A) three anterior caeca (*a.c.*) of unequal size: the two lateral being shorter than the medio-ventral; on the medio-dorsal side of the alimentary tube, at the junction of the mid- and hind-gut, arises a very short duct from which originate the four Malpighian tubes

(fig. 2, B). There is no posterior caecum connected with the mid- or hind-gut.

In the larva of *Bibio johannis* L., a good description of which we owe to Morris (1917), the four Malpighian tubes also arise from a common duct, but this joins the left side of the alimentary tube. Besides the three anterior caeca, this larva shows a posterior caecum which originates from the ventral side of the posterior end of the mid-gut, the caecum being directed forward. The alimentary canal of the larva of *Dilophus vulgaris* Meig., described by de Meijere (1915, p. 185), and *D. febrilis* L. (fig. 2, C) is similar to that of *B. johannis* L., as described by Morris, except that the Malpighian tubes in *Dilophus* arise from the dorsal side of the alimentary tube.

Anterior lateral caeca of similar structure to those in the *Scatopsidae* larvae also exist in all the larvae of the *Mycetophilidae* and *Ditomyidae* (*Ditomyia* and *Symmerus*), but the two posterior lateral caeca of *Scatopsidae* have not hitherto been observed in other Dipterous larvae. The single posterior caecum, as seen in Bibionid larvae, was found by Dufour (quoted by Morris) in the larva of *Tipula lunata* L., and by Anthén (1908) in that of *Ctenophora angustipennis* Lw. In a Tipulid larva, boring in a dead branch of elm, I found a posterior caecum of a very large size. In other Tipulid larvae (for example that of *Epi-phragma ocellaris* L.) this caecum is very much reduced. It is possible that the study of other Bibionid larvae will supply the link between the forms with a very well-developed posterior caecum and those which, like *Bibio hortulanus*, do not possess a trace of this organ.

Very few parasites have been recorded on the larvae of *Bibio*. Lyonet (1832) has rerecorded a mite and a nematode which he found on a *Bibio* larva, but he states that he was unable to say whether they were true parasites.*

Malloch (1917, p. 300), who reared a Hymenopteron from one of his breeding-cages containing *Bibio* larvae, doubted its parasitic relation to *Bibio*. Morris states that he never met a parasite of *Bibio johannis* L., and he quotes only the previous observations of Lyonet and those of Malloch.

* The following is a passage containing his observations:—"J'ai trouvé sur ce ver deux sortes d'insectes. Je ne puis dire s'ils sont parasites, ou si le hasard les y a fait rencontrer. Le premier avoit environ une ligne de longueur. Il étoit blanc, plat et extrêmement mince. C'étoit une espèce de Taenia sans articulation. L'un de ses bouts me parut rompu. Il se donna beaucoup de mouvements mais sans avancer ni reculer. La fig. 14 en fait voir la forme très en grand, et la fig. 3 trace assez grossièrement celle de l'autre insecte, que je ne pus bien représenter, parce qu'il m'échappa lorsque je commençai à en dessiner les contours. Il étoit plus petit qu'une mite, avait huit jambes, et l'extremité de son corps étoit fourchue, dans le sens que la figure le fait voir." De Haan, who edited Lyonet's work and who was responsible for the explanations of his figures, deserves credit for recognising Lyonet's "Taenia without articulation" as a Nematode. On the other hand, it is difficult to understand his explanation of Lyonet's fig. 3 (p. c. vii) as a "louse found on the larvae," for the figure itself, as well as Lyonet's text, clearly shows that it is a mite.

To these supposed parasites, of which the Nematode of Lyonet is the only one which seems to be certain, we may add the gregarine *Schneideria mucronata* Leger, which occurs in the mid-gut and anterior caeca of Bibionid larvae. In this connection it is somewhat interesting to note that the other species of the genus *Schneideria*, *S. caudata* Sieb., also occurs in the same region in Mycetophilid larvae (*Sciara nitidicollis*).

In Bibionid larvae collected both in France and in Cambridge I have also observed an epidemic bacterial disease. The affected larvae appear motionless and stiff, and the slightest puncture of the diseased larva's skin with a sharp needle leads to all the liquid in the larva gushing out, the insect's body becoming flat and flabby. The liquid extracted from these larvae when examined microscopically shows an enormous number of bacteria. When the disease appears among the larvae in a breeding-jar it spreads rapidly, and 150 to 200 larvae usually become affected in a few days. All these larvae die with their alimentary canal full of food. I have not yet noticed this disease in any other Dipterous larvae. Scatopsid larvae, however, are often infected by a Microsporidium, probably a *Glugea*, which invades the epithelial cells of the mid-gut and caeca.

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THE BIOLOGY OF DRAGONFLIES (ODONATA or PARANEUROPTERA)

By R. J. TILLYARD, M.A., B.Sc., F.L.S., F.E.S.

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THE MUSEUM, HULL;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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The Library is open daily from 9 a.m. to 6 p.m. (except on Saturdays, when it is closed at 2 p.m.), and until 10 p.m. on Meeting nights.

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ADDITIONAL NOTES ON THE INDIAN SPECIES OF *DIANOUS*.

BY G. C. CHAMPION, F.Z.S.

Since the publication of my account of the Indian species of *Dianous* (ante, pp. 41-55), my eldest son, H. G. C., has sent me another consignment from Kumaon, mostly from a lower elevation and a somewhat different district in the Himalaya, including three additional forms, as well as a long series of *D. lobigerus* (six only having been sent previously), two more specimens of *D. cyanogaster*, and one of *D. cameroni*. He also sends a fuller account of the places in which these astonishing assemblages of so many species of *Dianous* have been found, as well as notes on the habits of some of them. These notes prove that the possession of long lobes to the fourth tarsal joint must be of service to the species (*D. azureus* and *lobigerus*) living at the lower elevations where the fall is more rapid, enabling them to keep to the surface of the water during floods, those inhabiting quieter spots in the higher ground, *D. andrewesi* and others, having simple tarsi. The communication forwarded by H. G. C. is inserted in this paper after the descriptions of the three new species.

8 (a).—*Dianous azureus*, n. sp.

Robust, wholly caeruleous above and beneath, the antennae and palpi black; shining, finely cinereo-pubescent. Head rather small, closely punctured, rapidly, obliquely narrowed behind the eyes, the latter prominent and not very large, the intra-ocular grooves widely separated, shallow; antennae long, about reaching the middle of the elytra. Prothorax much narrower than the head, as long as broad, sinuously narrowed posteriorly; coarsely, closely, irregularly, subconfluently punctate, the disc obliquely compressed on each side at about the middle. Elytra large, subquadrate, as long as broad, nearly twice as wide as the prothorax, rounded at the sides posteriorly; closely, somewhat coarsely, uniformly punctate (the punctures similar to those on the head), the disc slightly depressed near the humeral callus. Abdomen closely, minutely, the sixth dorsal segment more coarsely, punctate; ventral segments uniformly punctate; anal brushes moderately long. Legs comparatively stout; fourth tarsal joint furnished with two long lobes.

♂. Sixth ventral segment triangularly emarginate, the seventh sharply dentate at each outer angle. Genital armature: lateral lobes long, slender, ciliate towards the apex within; median lobe rapidly narrowed to a sharp point.

Length 7-8 mm. (♂ ♀.)

Hab. INDIA, River Sarda Gorge, Tanakpur (H. G. C.: xii. 1918).

Twenty-eight examples. Separable from the other described Indian forms by its uniform brilliant blue colour, the comparatively small head and eyes, the coarsely, irregularly punctured prothorax, the simply punctured elytra, etc. The punctures on the elytra are coarser than in any of

the species placed by me under the first section of the genus (*ante*, pp. 42, 43); the fourth tarsal joint is strongly bilobed, as in *D. lobigerus*; and the seventh ventral segment of ♂ is dentate on each side at apex as in the last-named insect.

8 (b).—*Dianous cribrarius*, n. sp.

♂. Robust, shining, nigro-cyanous, the elytra (the humeri excepted), antennae, and palpi black; finely cinereo-pubescent, the prothorax and elytra subglabrous. Head large, sparsely punctured and broadly depressed between the eyes, and rapidly narrowed behind them, the intra-ocular grooves deep, not very widely separated, the intervening space polished in the middle; eyes large; antennae moderately long, very slender, joints 9-11 rather stout. Prothorax narrow, oblong-subcordate, coarsely, irregularly punctate, the disc with a deep oblique groove on each side at about the middle, the grooves separated by a narrow oblong, polished median space, the punctures transversely coalescent at the base. Elytra wider than the head, barely as long as broad, rounded at the sides posteriorly; coarsely, irregularly, rather sparsely punctate, the punctures on the outer part of the disc here and there confluent; depressed along the suture, near the humeri, and across the disc behind the middle. Abdomen sparsely, minately, the transverse sulci closely and much more coarsely, punctured; ventral segments uniformly punctate, the fifth triangularly emarginate; anal brushes long. Legs comparatively stout; fourth tarsal joint strongly bilobed.

Length 8 mm.

Hab. INDIA, Tanakpur (*H. G. C.*: xii.1918).

One male, separable from all the known Indian forms by the very shining surface; the slender antennae; the coarsely punctured prothorax and elytra, the latter in great part black, uneven, and with the punctures somewhat distant one from another; the comparatively smooth convex portions of the dorsal surface of the abdomen; and the strongly bilobed fourth tarsal joint.

9 (a).—*Dianous luteoguttatus*, n. sp.

♀. Black, with a faint brassy lustre in certain lights, the elytra each with a small, rounded, shining luteous spot on the disc beyond the middle; moderately shining, the abdomen, under surface, and legs finely pubescent. Head broad, closely punctured, rapidly narrowed behind the eyes, and broadly excavate between them, the intra-ocular grooves convergent anteriorly, deep, the eyes large; antennae long, extending beyond the base of the prothorax. Prothorax as long as broad, narrow, uneven, constricted at the apex and towards the base, the intervening space parallel-sided as seen from above; densely, rather coarsely, rugosely punctured, the punctures more or less confluent and separated by oblique rugae, the disc obliquely compressed on each side before and behind the middle, and flattened in the centre at the base. Elytra nearly twice as broad as the prothorax, subquadrate, rounded at the sides posteriorly; depressed on the disc beyond the middle, along the suture

anteriorly, and within the humeri, with coarse, dense vorticose sculpture, the punctures more conspicuous on the humeral callosities. Abdomen densely, minutely punctate; ventral segments uniformly punctured; anal brushes slender. Legs not very slender; fourth tarsal joint small, simply excavate at the apex above, furnished with a narrow pencil of hairs at the tip which reaches to about the middle of the fifth joint.

Length $7\frac{1}{2}$ mm.

Hab. INDIA, W. Almora (H. G. C.: vi.1918).

One specimen. Larger, more robust, and more rugose than *D. distigma*, the only other spotted Himalayan species of the genus known to me; the head larger, and broadly excavate between the eyes, the space between the frontal sulci less convex; the anal brushes very narrow; the small fourth tarsal joint without lobes, and simply penicillate at the tip, as in *D. annandalei* Bernh.

THE OCCURRENCE OF *DIANOUS* IN ALMORA, KUMAON, U.P., INDIA.

The sandy and pebbly banks of the lower stretches of the streams in the valleys of the Almora District at once attract the attention of the Coleopterist as likely collecting-ground; they appear to be the only likely spots in the vicinity, since cultivation occupies every acre of reasonably level ground, and, as terraces extend a long way up the slopes, to be succeeded in turn by a belt on which all tree-growth has been destroyed. The streams themselves run swiftly over their stony beds, are quite free from any kind of weedy growth, and are of such size that, though easily fordable in their wider parts during most of the year, they are frequently impassable during the rains; muddy banks are quite exceptional, but small sandbanks and places with stones resting on clean sand are found here and there along them. Further, it may be noted that the district has three separate drainage systems, all emerging separately into the plains, although the heads of one of them (the Kosi), and of important branches of the other two, meet in the conspicuous peak of Bhatkot, 9086 feet above sea-level.

Collecting along these lower streams actually proves well worth while, and at almost any season of the year a considerable number of species can be found, whose general facies is very like that of what is met with in similar places in Britain. In fact, most of the genera are at once recognisable, such as *Bembidium*, *Tachys*, *Perileptus*, *Brachinus*, *Nebria*, *Drypta*, *Paederus*, *Bledius*, *Heterocerus*, *Cryptohypnus*, *Anthicus*, *Ochthebius*, *Laccobius*, and so on. In the rains, as might be expected, there is much less to be found, except that Cicindelids, especially *Cicindela chloris* and its varieties, occupy the higher sand-banks in force.

Altogether, this is not the type of ground on which one would expect to find *Dianous*, and when casual single specimens of *D. andrewesi* and two other species of the genus were picked up, I at once suspected that these must be stray examples drifted or washed down from higher altitudes, and made a note to search for them there, should opportunity offer.

The chance came in the beginning of May 1917, when I had occasion to examine in detail the forests at the head of the Kosi in Bhatkot. Chir (*Pinus longifolia*) forest gives way to oak (*Quercus incana*) at about 6000 feet, and the terrain for the next 1000 feet is very precipitous, affording an effective barrier to the ubiquitous cattle, and when one comes across comparatively gentle slopes, at about 7000 feet, to the top of the ridge, densely clothed with oak (here mostly *Q. dilatata*, not unlike *Q. ilex*) and silver fir, and with clear streams tumbling over moss-covered boulders, a splendid collecting-ground is reached. The first day I had in the forest here abundantly proved the correctness of my earlier deduction—*Dianous* literally swarmed on the spray-sprinkled boulders, so that it is no exaggeration to say that there must have been four or five specimens to every square foot of exposed rock. As usual, it was impossible for me to stay long on the spot, but in a short time I completely filled a small spirit-tube, and although several forms were noticed, I was surprised to find seven species represented, as proved to be the case when the material was examined some days later. It was a matter for regret that I was unable to examine the tube earlier, since at least 95 per cent. of the examples captured belonged to two species—the eupreous *D. andrewesi* and the shining black *D. radiatus*—the remainder, which were mostly larger than the foregoing, and of about the size of the British *D. coeruleascens*, being represented by only one or two examples each.

Throughout the following twelve months specimens came to hand singly or a few at a time in places at about 6000 feet, similar to but less suitable than the locality above described, others in flood débris wedged in between rocks in mid-stream, others on floating logs, and so on. As still further species were included, I made every effort to search again, but pressure of official duties did not allow of this, and the best I could do was to send my collector (a new man, the first having left me after a year, as he was tired of being chaffed about such pursuits) to the original locality, trusting that he would be able to find it and to recognise what I wanted him to obtain. Fortunately, he was very successful and brought back upwards of 200 *Dianous*, including perhaps a dozen species. Two representatives only of the allied genus *Stenus* were brought with them.

Although each species of *Dianous* almost certainly has its different favourite conditions of wetness, or mossiness of stones, elevation, light, season, etc., both for the adults and earlier stages, I have been unable with the short time at my disposal to make any detailed observations, though I hope to do so at some later date. However, it may be noted that the two commoner species, *D. andrewesi* and *D. radiatus*, are not met with at the lower elevations in the overwhelming percentage with regard to the others that prevails above; in fact *D. caeruleonotatus* is probably the most frequently seen, then *D. andrewesi*, whilst *D. radiatus* is relatively rare.

Until quite recently, I had not collected specimens of this genus below about 3500 feet, but at Christmas, 1918, I was in camp on the banks of the Sarda River (with which the waters of the Sarju debouch into the plains), at an elevation of about 1000 feet, just before it leaves the hills. During several days of assiduous collecting no *Dianous* were to be seen, but presently *D. lobigerus* turned up rarely, and finally it was found in numbers apparently quite at home on the boulders and wet sand where a side stream came down, and with them a couple of specimens of a fine new blue form, *D. azureus*, and a solitary example of *D. cumeroni*; the generally common *D. andrewesi* was not seen here. This spot, at least in the cold weather, has neither the spray nor the moss one associates with the usual habitat of the genus, and in the rains it would have been entirely submerged. The above notes will suffice to show how well represented is the genus *Dianous* in the Himalaya, where it apparently largely replaces *Stenus*, for, apart from the two species referred to above, I have met with only a few others in the last three years, and these usually occur in relatively dry spots, such as under stones in fields and in moss away from water.

H. G. CHAMPION, Working Plans Officer,
West Almora Division, Almora, U.P.
January 29th, 1919.

A SYNONYMIC NOTE.

BY K. G. BLAIR, B.Sc., F.E.S.

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In this Magazine for July last (3rd ser. vol. iv, pp. 149–152) I characterised, with figure, *Catobleps* as a new genus of *Tenebrionidae*. M. Maurice Pic has since pointed out (L'Echange, 1918, p. 15) that this genus is the same as that described by him under the name *Falso-cossyphus* (Mél. exot.-ent. xvii, 1916, p. 4) and classified as possibly forming a new subfamily of the *Tenebrionidae* near the *Cossyphinae*.

I must plead guilty to having failed to recognise *Falsocossyphus* Pie as the genus of the insect I was studying, and certainly should not consider the position suggested as a likely place to look for it.

It now appears that a third name has been given to the same insect, for Dr. K. M. Heller has fully described and figured it in the "Tijdschrift voor Entomologie," ix, 1917, pp. 376-381, pl. 4, under the name of *Blatticephalus adelotopus*. That I had not seen this paper before publishing my own is unfortunate but could not be helped, as the periodical in question was only received here some months after my paper had appeared.

Here we find yet other views as to its systematic position, for Dr. Heller considers his genus to be an aberrant branch of the family *Melandryidae*. Undoubtedly its superficial resemblance to *Eustrophus*, with which Heller compares it, is considerable, though he himself points out certain important structural differences, e. g., the closed anterior coxal cavities, the confluence of the gular sutures, the lack of pleural sutures of the pro- and mesothorax, the wing-neurulation, etc.; these, however, the German author does not consider of sufficient weight positively to exclude the genus from the *Melandryidae*.

Further consideration of this point, particularly in the light of Dr. Heller's arguments, has confirmed me in the opinion expressed in the above-mentioned paper. I then placed the genus in the subfamily *Rhysopaussinae*, allying it to *Stemmoderus* Spin. and through this to *Gonoenemis* Thoms. The close relationship of *Falsocossyphus* (of the three names given to the genus, this unfortunately chosen appellation has priority) to *Stemmoderus* is, I think, certain; the structure of the mouth-parts and gular sutures, also of the antennae, is practically identical; that of the anterior coxal cavities is very similar, though in *Falsocossyphus* the prosternal process separating them is strongly produced ventrally and backwards: in *Stemmoderus* it is not at all produced; in *Eustrophus* the side-pieces fail by a long way to meet the median process so that the cavities remain open behind. The most important differences are in the structure of the legs and of the face, but in *Falsocossyphus* these are highly modified for defensive purposes.

The affinities of *Stemmoderus* and *Gonoenemis* are not so evident, but in my opinion quite demonstrable. A striking feature is the wing-structure, which is practically identical. This in both genera differs from that of *Falsocossyphus* in the presence (imperfectly developed in *Stemmoderus*) of a transverse nerve connecting vii (Cu_2) with the closed cell of ix (A_1 and A_2), but that of all three genera agrees in the very

characteristic strongly defined Y-shaped chitinisation in the apical area; in all three genera this is connected with the posterior margin of the wing towards the apex by a strong vein not figured in Heller's plate.

As regards the synonymy of the species the identity of *F. adelotopus* Heller with *F. battroides* Blair is practically certain, the first-mentioned name having priority; that of *F. pilosus* Pic with *F. chatanayi* Blair, both hairy insects, the former described from Calcutta, the latter of unknown locality, is uncertain without comparison of specimens.

London.

April 1919.

A NEW ABERRATION OF *COSYMBIA (EPHYRA) PENDULARIA* CL.

BY F. C. WOODFORDE, B.A., F.E.S.

I obtained ova of this species from a female captured in North Staffordshire in May 1917. The offspring emerged in May 1918, most of them being intermediate between the typical form and ab. *subroseata* mihi (which Mr. Prout informs me that he does not now consider to be identical with ab. *decoraria* Newman), but one of them was different from any of the others and from any other form of the species that I have seen. The ground-colour of this specimen is darkish grey. The 1st and 2nd lines are indicated by rows of black dots rather larger than usual, the 2nd in both primary and secondary wings being bordered by a narrow whitish band, faint on the inner side, but conspicuous on the distal side. The ocelli are very conspicuous. A very narrow, indistinct reddish band crosses the centre of the wing. The cilia are whitish. The insect so much resembles a dark form of *C. orbicularia* Hb. that I propose naming it ab. *orbiculoides*. It is now in the collection of the Hope Department, Oxford University Museum.

Oxford.

April 1919.

A NEW BRITISH HETEROPEZINE FLY.

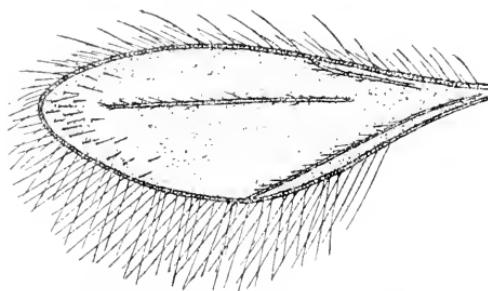
BY F. W. EDWARDS, B.A., F.E.S.

In Messrs. Bagnall and Harrison's admirable Preliminary Catalogue of British Cecidomyiidae (Trans. Ent. Soc. Lond. 1917, pp. 346–426) only one member of the subfamily *Heteropezinae* is included, and even that has not been determined specifically. Doubtless many occur with us; I have myself come across their paedogenetic larvae in several localities under bark, and once also in a fungus, while Dr. D. Keilin

informs me that he has found and reared a species of *Miastor* near Cambridge. But the species are difficult to rear and cannot be named from larvae alone. I have, however, also been fortunate enough to obtain a number of adults of one apparently undescribed species, which it may be of interest to name and record. The specimens were all taken on windows in my house at Letchworth, chiefly during June 1917, a few in August 1917, and one or two in June 1918. While conforming to Kieffer's description of the genus *Leptosyna*, they show obvious differences from the two known European species, and may be described as follows:—

Leptosyna setipennis, n. sp.

♂. Body brownish yellow, long, and narrow. Wings transparent. Palpi composed of a single joint, which is retracted within the mouth-cavity and bears a single terminal bristle about as long as the joint. Antennae with 2 + 10 joints, the last joint bearing an appendage resembling another joint, as long as but narrower than the basal part. First scapal joint with a single long ventral bristle, second bare. Flagellar joints with verticils of about



Leptosyna setipennis, n. sp. Wing.

8 hairs which are about three times as long as the joints; the first two have one or two additional long hairs near the base. All flagellar joints except the first and last drawn out into necks which are almost as long as the more swollen basal portion; at the base of the neck there appears to be a small round pore, just below which are inserted the verticillate hairs. Genital claspers barely twice as long as broad, with a short thick terminal spine. Legs rather slender; femora scarcely, tibiae not at all thickened towards the tip. All tarsi alike; proportionate lengths of joints 1:2:1.5:1:1. Claws simple; empodium barely half as long as the claws. Wings slightly pointed, with a very long posterior fringe; the surface appears minutely dotted when seen under a $\frac{1}{2}$ " objective, while towards the tip are about 20 suberect hairs directed towards the base of the wing. Sc terminating before, Cu slightly beyond the middle of the wing; R obsolete both basally and apically; all veins setose except base of Cu.

♀. Antennal joints almost globular, without neck, hairs inserted just

beyond middle; appendage of last joint shorter. Terminal lamellae of abdomen oval, barely twice as long as broad. Hairs at wing tip slightly more numerous. Otherwise as in the ♂.

Length of body, 0·9-1 mm.; of wing, 1·0 mm.

The genus *Leptosyna* is interesting as representing the extreme of vein-reduction in a fully-winged fly. The most noteworthy point about our species is the presence of surface hairs at the tip of the wing, which will necessitate a slight remodelling of Kieffer's definition of the subfamily *Heteropeziinae*. Presumably these hairs are absent in the two species described by Kieffer, since he does not mention them, but *L. setipennis* may also be distinguished from *L. quercus* by the radial vein (cubitus of Kieffer) not reaching the tip of the wing, and from *L. acutipeunis* by the slender femora and tibiae and the different proportionate lengths of the tarsal joints.

L. setipennis is one of the smallest, if not actually the smallest, of British Diptera. A few species of *Culicoides* and *Ceratopogon* may be shorter in length of body, but are of stouter build. The elongate form of *Leptosyna* gives it a rather striking resemblance to the *Mymaridae*.

56 Norton Road, Letchworth.

March 21st, 1919.

ON THE BRITISH SPECIES OF *EUTELIX* GERMAR.

BY JAMES EDWARDS, F.E.S.

It has been customary to segregate specimens of this genus by the relative length of the head, thus: short (*cuspidata* Fab.), medium (*producta* Germ.), and long (*depressa* Germ.). This, however, is unsatisfactory, because these insects, following the rule in *Jassina*, have the crown of the female distinctly longer in proportion than that of the male: consequently, the short-headed category comprises only the males of *cuspidata*. Female *cuspidata* and male *producta*, of which we are certain, have the crown of medium length; and the really long-headed section, of which I have never seen a male, includes two kinds differing in the relative proportion of the last ventral segment to the preceding one.

Our present knowledge is summarized in the following table:—

- 1 (2) Crown broader than long, the sides convex. Male: upper apical angle of side lobes of pygofer blunt but distinct; style broader than that of *producta*, truncate at the apex *cuspidata* Fab.
- 2 (1) Sides of crown not convex.
- 3 (6) Crown as broad as long, the sides a little indented at the ocelli.

- 4 (5) Males: having the upper apical angle of side lobes of pygofer completely rounded off; style narrower than that of *cuspidata*, pointed at the apex *producta* Germ.
- 5 (4) Females: having the last ventral segment sub-equal in length to the preceding *cuspidata* Fab.
- 6 (3) Crown longer than broad, the sides very evidently indented at the ocelli: females.
- 7 (8) Last ventral segment sub-equal in length to the preceding. *producta* Germ.
- 8 (7) Last ventral segment at least one-half longer than the preceding. *depressa* Germ.

No definitive account of the apex of the male abdomen in *E. depressa* has been published, and one can only say with certainty that we have in this country two kinds of males and three kinds of females. I have no direct evidence that the female here assigned to *producta* really belongs to that species.

The object of this notice is to incite field entomologists to the collection of material in this genus so that the doubtful points may be cleared up; and there is, therefore, no advantage in discussing the literature of the subject in detail.

Colesborne, Cheltenham.

April 7th, 1919.

Phloeopora angustiformis Baudi.—In Fowler's "British Coleoptera" (vol. ii, p. 43) he mentions a specimen of this genus under the name of *transita* Muls. and Rey, and he treats it as a variety of *P. corticalis*. In Newbery and W. E. Sharp's very useful and careful list of British Coleoptera (1915, p. 11) the name *transita* is given as a synonym of *angustiformis* Baudi, and treated as a distinct species. I know of no other reference to the insect in British literature, and the example mentioned by Fowler is without any other locality than England. I may therefore record that I found three specimens at Sherwood that agree with the description of *angustiformis* given by Ganglbauer (Käf. Mitteleur. ii, p. 104), and that it is undoubtedly a good species nearer to *reptans* than to *corticalis*, distinguished by its smaller size, narrower form, and dark colour. *P. reptans* is identified by Ganglbauer as *testacea* Mann. As at present understood, it is a variable species, and it is not improbable that there may be more than one under the name. I have a specimen from Thornhill that has a slightly different head as well as being unusual in colour and puncturing, but looking to the variation of other specimens it cannot at present be satisfactorily separated.—D. SHARP, Brockenhurst: March 21st, 1919.

Note on Pterostichus angustatus Duftt.—The warm weather to-day tempted me to visit a sawmill in our pine-woods, mainly to ascertain whether any of the special Coleoptera observed there during the past two years were still to be obtained. Only one of them, *Pterostichus angustatus*, put in an appearance. This insect occurred sparingly round the mill in the sawdust from the

freshly cut wood; but in the older and drier sawdust, used to cover a corduroy road running across the very boggy ground from the mill to the places where the trees were being felled, the species was entirely replaced by the nearly allied and much commoner *P. nigrita* F., of which a dozen examples were bottled at random along the edges of the road. It is evident that *P. angustatus* requires the sawdust with a sappy flavour, doubtless on account of the numerous *Epuraea*, *Rhizophagus*, Scolytids, etc., to be found there, upon some of which it must feed. I saw none on the adjacent charred ground.—
G. C. CHAMPION, Horsell: April 19th, 1919.

Ptinus sexpunctatus Panz. and *Osmia rufa* Linn.—I have received from Mr. C. Glanville Clutterbuck numerous specimens of *P. sexpunctatus*. These were discovered in Gloucester by a builder, "who said that they had eaten holes in some lead on a roof!!" The only Suffolk record is, "Occasionally near Bungay" by Dr. Garneys, who took examples of it in his house there on May 3rd, 1861. I have never met with the insect in the course of thirty years' collecting. *Osmia rufa*, pupae of which were discovered at the same time in Gloucester, is more likely to have damaged the lead; though I have never heard of such an occurrence.—CLAUDE MORLEY, Monk Soham House, Suffolk: April 5th, 1919.

Deronectes depressus Fabr. and *elegans* Panz.—In the "Annals and Magazine of Natural History," ser. 9, vol. iii, pp. 293–308, pls. 7 and 8, April 1919, Capt. F. Balfour-Browne gives an exhaustive account of these two Dytiscid beetles, hitherto treated as synonymous in our text-books, but which he considers to be specifically distinct. One of these, *elegans* Panz., he says is common throughout England and Scotland, while the other, *depressus* Fabr., seems to be limited in its distribution, being confined, so far as he knows at present, to Scotland and the North of England and to Ireland, where it is apparently the only one found. The characters upon which the two species may be separated are said to be three in number: (1) the shape of the thorax in ♂ and ♀, (2) the form of the anterior tarsal claws in ♂, and (3) the form of the aedeagus. The actual differences are not given in tabular form, but they are shown on the two plates, an enlarged ♂ and ♀ of each species being figured, as well as the other structures mentioned; variations in the form of the aedeagus are illustrated in text-figures on p. 297, from nine examples of each insect. The article includes a special account of the Thorax, Anterior tarsal claws of the males, and Aedeagus, the Habitat and Britannic Distribution (which is given in great detail), and a full Bibliography.—Eds.

Notes on the habits of Heterocerus.—In a paper in the "Canadian Entomologist" for February 1919, vol. li, p. 25, pl. 1, under the heading "Popular and Practical Entomology, Notes on the habits of *Heterocerus* beetles" (*H. pallidus* Say and *H. tristis* Mann.), Mr. G. B. Claycomb gives a very interesting account of these insects, illustrated by a plate showing: (1) mud bar where the beetles breed, (2) burrows made by the larvae, (3) pupal cases, (4) adult beetle [*H. tristis*], (5) eggs, (6) larva, (7) larva ready to pupate, (8) pupa. He writes as follows:—"In the hot dry days of summer, when the creeks run low and the mud bars become numerous along the margins of the streams, a common sight on this recently deposited mud is

the network of lines which mark and ramify the surface. Investigation shows clearly that some small animal has pushed its way through the soft alluvium and formed little tunnels in the freshly exposed sediment left by the receding water Along a small creek in western Illinois on a day late in July, the entire life-history of the little builder of the burrow was found in all completeness. Near the water, just beneath the surface of the soft squashy mud, were the tunnels, freshly made. Farther back on the dryer portion of the bar, the tunnels were more numerous and the elevation of the soil which marked the passages was more distinct, due to the drying of the earth. Still farther back the lines formed, in places, an almost unbroken mat, so extensive had the network become. On the higher, firmer portions of the deposit, among the older less distinct galleries, were little cases with chimney-like extensions projecting from the mud. Here, then, was the life-history of these interesting beetles in all its completeness within this very limited area. The adult beetle was found to be the maker of the tunnels in the fresh mud near the water. Several were captured within the burrows, and others, when disturbed, forced their way out through the mud and flew away. In these newly constructed passages are laid the eggs in small masses. The eggs hatch into active running larvae which greatly extend the home already started for them by the adult, growing to a length of 7 or 8 mm. The larvae construct for themselves the mud chambers with the peculiar little chimneys extending up from them. The openings of these chimneys are usually closed near the top by a very thin layer of dry mud. These structures become firm and strong after they are dry. In the chamber the larva changes to a pupa. Beside the larvae and pupae, several adults were found within the cells. At the time of pupation the larvae [presumably of the larger species, *H. pallidus*] measured 7-8 mm. in length, and the cases averaged 10 mm. in their longest dimension When the place was visited a few days later, a rise of the stream had obliterated the entire colony, and nothing remained but the plain mud bar." The larvae (as seen from profile views) are much more elongate than the one shown by Westwood in his "Introduction to the modern classification of Insects." A good illustration, however, of the larva of *H. fenestratus* Thunb. (after Letzner), is given by Ganglbauer (Käfer Mitteleurop. iv, p. 129, 1904) and Reitter (Fauna Germanica, iii, p. 174, fig. 54, 1911).—Ebs.

Occurrence of Orneodes huebneri in Canada.—Amongst some Micro-Lepidoptera very kindly collected for me by Dr. A. Jefferis Turner on his way back to Australia is an undoubted example of *Orneodes huebneri*, taken at Calgary, Alberta, late in August; I believe the species has not been recorded from America, which is a considerable extension of its range (Europe to the Himalayas and South Africa). I suggest the insect may probably have entered from the west, whilst *hexadactyla*, the only other recorded North American species, probably came from the east.—E. MEYRICK, Thornhanger, Marlborough: March 20th, 1919.

Proportion of the sexes in Deinacrida (Hemideina) megacephala Buller.—During the whole of my entomological experience in New Zealand I have noticed that, unlike most species of insects, the females of the common "Weta" (*Deinacrida megacephala*), a huge apterous cricket common throughout the North Island of New Zealand, are more numerous than the males. To-day, whilst

removing a partially decayed barge-board from the roof of an old fowl-house overgrown by trees, I discovered, closely huddled together, in a space underneath the board, a mature male "weta" and no fewer than three mature females. This observation would seem to suggest that each male may regularly consort with several females which, if correct, would be a most unusual habit amongst insects. It thus appears probable that the extremely forbidding appearance of the male "Weta," with his huge head and jaws and ferocious demeanour, is indicative of an intense rivalry between the members of that sex, and a heavy mortality of the weaker males, brought about by this rivalry, may explain why the female insect is more frequently met with. Actual conflicts between males could hardly be witnessed owing to the strictly nocturnal habits of the insect.—G. V. HUDSON, Hillview, Karori, Wellington, N.Z.: *February 21st, 1919.*

Société Entomologique de Belgique.—In a Circular recently received from this Society, dated February 18th, 1919, and signed by the Secretary, M. Schouteden, we gather the following particulars as to the resumption of their Meetings, and the continuance of the publication of their "Annales," vol. lviii (1914) of the latter having been stopped during the war. At an Extraordinary General Meeting of the Society held on February 16th, at the Rue de Namur 89, Brussels, it was decided that the Monthly Meetings would be resumed on March 1st, and that a new class of Members, "Membres Associés," would be instituted. These latter to pay 7.50 fr. annually (instead of 16 fr., the rate for a "Membre Effectif"), and be eligible to attend the Meetings, Conferences, and excursions organised by the Society, and to receive the "Bulletin" (to be started during the present year) free. The minimum age for this new Class is fixed at 15 years. We trust that the Society will soon be able to resume its pre-war activity, an uninterrupted series of 57 volumes of the "Annales," a series of 21 Mémoires, etc., having already been issued under its auspices.—EDS.

Review.

"THE ZYGOPTERA, OR DAMSEL-FLIES, OF ILLINOIS." By PHILIP GARMAN, Ph.D. Bulletin of the Illinois State Laboratory of Natural History, vol. xii, article iv, June 1917. Pp. 411-537, pls. lviii-lxxiii.

It is to be regretted that a notice of this publication should have been so long delayed, but it is hoped that it may not yet be considered too late to congratulate Dr. Garman and the Illinois State Laboratory upon a production of outstanding merit. It is too often a fault of papers professing a restricted geographical outlook that they fail to prepare the student in any way for a more extended study of the subjects of which they treat. The work before us is entirely free from that blemish, and provides an excellent introduction to the science of dragon-flies, properly so-called. Perhaps the most arresting feature of the paper is the large proportion of nymphs of which it has been possible to furnish descriptions and figures. Several of these are admittedly new to science, and it would have been a good thing if the author could have stated that he was describing a nymph for the first time, whenever such was actually the case.

The number of species of Zygoptera occurring, or probably occurring, in the State of Illinois is stated to be forty-two, which corresponds exactly with the total number of Odonata of both suborders known from the British Isles.

Numerous details of nymphal and imaginal structure are illustrated by means of 228 figures, arranged in 16 plates. A high standard of excellence is maintained throughout the series, but the explanations of the plates stand in need of a little revision. The inclusion of the numbers 217, 222, and 228, belonging to pl. lxxiii, in the references to pl. lxxii, is unfortunate and confusing. The figures on pls. lxviii and lxxi, described as "anal appendages of adults," represent anal appendages of the male sex alone. Fig. 205, however, must have been included among these structures by mistake, as it is evidently intended to correspond with figs. 118, 121, 147, 165, 171, 172, and 183, which show the paired plates on the ninth abdominal segment of the male. The same error in designation has found its way into the text (p. 530), and the number 205 is omitted from the list of references on p. 436, to which it rightly belongs. These figures of male gonapophyses, here termed "parameres," claim attention from another point of view, inasmuch as they reveal wide differences in the form of structures which have never been employed at all extensively as diagnostic characters. Equally interesting and little-used characters are found in the female sex. These are the thoracic structures known as the mesostigmal (=mesostigmatic) plates, and an entire plate is devoted to their representation, in addition to several other figures included in pls. lxix and lxx. Among the plates referring to the nymphal stages, special mention should be made of the fine series of figures of caudal gills, reproduced in pls. lxii-lxiv.

The hope may be expressed that a similar treatise, dealing with the Anisoptera of Illinois, is in contemplation by the same author, and likewise that the same eminently satisfactory mode of publication may again become available to him.—HERBERT CAMPION.

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
February 13th, 1919.—Mr. STANLEY EDWARDS, F.L.S., F.E.S., President, in the Chair.

Mr. Ashdown exhibited some of the Coleoptera referred to in "Ent. Record," Dec. 1918, viz. *Mordella aculeata* and *Agribus sinuatus*, species new to Surrey, and the rare streaked ab. *hebraea* of *Anatis ocellata*. Mr. Tatchell, *Vanessa io*, with aberrant ocelli on hind wings, *Aglais urticae* ab. *connexa*, a large *A. urticae* ab. *versicolor*, and the beautiful parasitic Hymenopteron *Mutilla europaea*. Mr. Turner, a long series of *Louwia (Chrysophanus) alciphron* from various localities, including (1) type from Bueta, (2) *gordius* from the Alps, (3) *grenadensis* from Spain, (4) ab. *intermedia* from Italy, (5) ab. *riduata*, (6) *meliboeus* from Bosnia, (7) ab. *subfasciata*, and (8) ab. *insulvata* ♀. Mr. R. Adkin, captured and bred specimens of *Dioryctria abietella* from Forres, and read notes on the species, asking for information on details of its life-history. Mr. A. W. Buckstone, bred series of *Vanessa io* from

Surrey, including ab. *cyanosticta*, and referred to various minor aberrations and variations in their markings. He also showed drawings, by the Rev. C. R. N. Burrows, of the genitalia of the dwarf and other races of *Agriades coridon* recently discussed, and read the comments received with the sketches. Mr. Bennett, details of the life-history of *Coleophora nigricella*, and read notes on the mode of progression of the case-bearing larva, with a series of photographs in illustration.

February 27th, 1919.—The President in the Chair.

Mr. Newman exhibited a series of *Cosymbia pendularia* var. *decoraria* (*subroseata*) bred from ova; they were forced to emerge in January and were all finely developed large specimens. Mr. Bowman, a black form of *Hibernia leucophaearia* with conspicuously white fringes, taken in Epping Forest in 1909. Mr. Turner, a series of *Camptogramma bilineata* var. *testaceolata* from Cyprus and called attention to the various forms (seven) so far named, with the range of possible variation. He also showed a short series of the rare and local *Pontia chloridice* from Cyprus, with its close allies *P. daplidice* (generally distributed) and *P. callidice* (alpine).

March 13th, 1919.—The President in the Chair.

The decease of Mr. A. King was announced.

Mr. R. Adkin exhibited *Scardia boleti*, generally regarded as rare, taken last June in the New Forest. Capt. B. S. Curwen, *Coscinia striata* ab. *melanoptera* and *C. cibrum* and ab. *candida* from Switzerland, *Uteheisa pulchella* from Gibraltar, *Parasemia plantaginis* with ab. *matronalis* and ab. *hospiata*, and *Orodemnias quenselii* from Zermatt. Mr. Sperring, *Pieris napi* with an unusually pale underside of hind wings for a British specimen. Mr. H. J. Turner, a series of *Melanargia pherusa* and its ab. *plesaura* from Palermo, Sicily, with *M. syllius* from Hyères for comparison; also a few butterflies from Palestine sent by Mr. H. W. Andrews, including *Anthocharis belemnia*, *Teracolus fausta*, *Zizera galba*, *Chrysophanus thersamon*, etc. Mr. Edwards, various species of the genus *Opsiphanes* and its allies from S. America. A short discussion on the season and on the occurrence of *Cetonia aurata* and *Aronia moschata* in the London suburbs.

March 27th, 1919.—The President in the Chair.

Mr. Ashdown exhibited very dark specimens of *Drepana binaria* and *Taenioecampa instabilis* just bred from Surrey larvae. Mr. Buckstone, *Lycia hirtaria* bred by the late Mr. T. H. Archer, many males of deep black, but slightly relieved by yellow markings. Mr. H. J. Turner, (1) a long series of *Zygaena rhadamanthus* from Hyères with ab. *cingulata*, (2) a series of *Abraeas pantaria*, closely resembling *A. sylvata*, a species formerly held as British. Mr. Bowman, a melanic *Hibernia defoliaria* with pure white cilia from Epping Forest. Mr. Moore, *Pyrrhocoris aegyptius* (Hemipt.), a *Truxalis*, a *Mantis*, and other Orthoptera from the Libyan Desert. Mr. Barnett, a bred *Hemaris fuciformis* from Horsley with very narrow wings and aberrant markings. Mr. Priske, a long series of *Helix hortensis* shells to show the range of aberration. Mr. Tatchell, a *Pyrameis atlanta* with a discal blue patch, and a gynandromorph *Polyommatus icarus*. Lieut. L. A. Box, various Hymenoptera and

their associates, prey, etc., with notes on their habits, including *Cerceris arenaria*, *Vespa norvegica*, *Crabro capitosus*, *Mellinus arvensis*, *Syntomaspis cyanea*, etc. Mr. Edwards, S. American *Nymphalidae*, including *Clithilda insignis*, etc. Mr. Tonge, a coal-black female of *Hibernia progemmaria v. fuscata*.—HY. J. TURNER, Hon. Editor of *Proceedings*.

NOTES ON THE PYTHIDAE WITH DESCRIPTIONS OF NEW SPECIES.

BY K. G. BLAIR, B.Sc., F.E.S.

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In working out the undetermined material of this family contained in the British Museum Collection, I have found many species that apparently have never been described, as well as others that have been evidently misplaced in the genera to which they have been assigned.

Attempts have already been made by various authors to break up some of the larger genera—*Sphaeriestes* (= *Salpingus*), *Lissodema*, and *Rhinosimus*—into subgenera; in many cases these divisions appear to be well worthy of retention, but in some instances, probably through having been based upon too localised a fauna, they do not appear to form structurally separable groups. Something further in the same line is here attempted, but many of the described species remain unknown to me, and the descriptions are too meagre for me to deal anything like adequately with the genus *Sphaeriestes*.

As all the genera considered belong to the subfamily *Salpinginae*, a key to the described genera (subgenera being given equal value) of this subfamily is given in the hope that it may facilitate study of the group.

Key to the Genera of the Salpinginae.

1. Antennae with last 3 joints enlarged, forming an abrupt 3-jointed club 2.
 - Antennae gradually thickened towards apex, often forming an indistinct club of 3-6 joints 9.
 2. Thorax not margined at the sides; rostrum short or wanting 3.
 - Thorax transverse, with lateral impressions forming a more or less complete marginal line; antennal club very pronounced 7.
 3. Sides of thorax not denticulate 4.
 - Sides of thorax denticulate 6.
 4. Form elongate, parallel. Head not or scarcely rostrate, not enlarged in front of antennae 5.
 - Form oval, head and thorax considerably narrower than elytra; head with a short rostrum enlarged in front of antennae.
- 3. *NEOSALPINGUS* Blackb.

5. Sides of thorax subangulate, widest a little behind apex, thence narrowed to base; 2nd and 3rd joints of antennae not longer than broad.
..... 1. *ISISTRIA* Lew.
- Sides of thorax rounded, widest a little before middle; 2nd and 3rd joints of antennae elongate 2. *SOSTHENES* Champ.
6. Prothorax feebly narrowed towards base, the sides sharply denticulate; elytra with confused lines of punctures.
..... 4. *LISSEODEMA* Chrt.
- Prothorax strongly narrowed towards base, the sides obtusely crenulate; elytra strongly striate-punctate 4a. *STENOLISSODEMA* Desbr.
7. Antennae evidently 11-jointed, 1st joint large and inflated 8.
- Antennae apparently 10-jointed, 1st joint small and concealed, 2nd joint large 7. *LANTHANUS* Champ.
8. Rostrum not longer than wide: marginal line of thorax irregular.
..... 5. *PLATYLISSODEMA*, nov.
- Rostrum much longer than wide; marginal line of thorax more or less regular 6. *PLATYSALPINGUS*, nov.
9. Thorax denticulate or tuberculate at sides 10.
- Thorax not denticulate or tuberculate at sides 13.
10. Head not rostrate, almost rounded in front of eyes.
..... 8. *PLATAMOPS* Reitt.
- Head with short stout rostrum, clypeus broadly truncate in front. 11.
11. Thorax sharply denticulate at sides; body glabrous.
..... 9. *SALPIDEUM* Alt.
- Thorax tuberculate rather than denticulate at sides; body with long erect hairs 12.
12. Thorax with broad median depression, truncate in front; eyes not contiguous with anterior margin of thorax. 10. *NOTOSALPINGUS* Blackb.
- Thorax evenly convex, feebly rounded in front; eyes touching anterior margin of thorax 11. *TRICHOSPHAERIESTES*, nov.
13. Rostrum short, wider than long 14.
- Rostrum at least as long as wide, often much longer 20.
14. Body apterous; penultimate tarsal joint small.
..... 12. *Poophylax* Champ.
- Body winged 15.
15. Hind femora and tibiae incrassate, at least in ♂; body hairy.
..... 13. *ONCOSALPINGUS*, nov.
- Hind femora and tibiae simple; body usually glabrous* 16.
16. Head narrowed from eye to front of clypeus; dorso-lateral carina straight.
..... 17.
- Head widened in front of antennae; dorso-lateral carina sinuate 18.
17. Elytral epipleura distinct to apex; last 4 (or 5) joints of antennae thickened. 14. *SPHAERIESTES* Steph.
- Elytral epipleura disappearing at about middle; last 3 (or 4) joints of antennae thickened. 15. *SALPINGELLUS* Reitt.
18. Antennal grooves extending to eyes 19.
- Antennal grooves not reaching eyes. 18. *COLPOSIS* Muls.

* Some exotic species described as *Salpingus* have a sparse pubescence.

19. Thorax not constricted before base; humeri evident.
 16. *RABOCERUS* Muls.
 Thorax constricted before base; humeri not developed.
 17. *PSEUDORABOCERUS* Pic.
 20. Rostrum about as long as wide, scarcely wider towards apex.
 19. *VINCENZELLUS* Reitt.
 Rostrum longer than wide, widened towards apex21.
 21. Antennae with last 6 joints enlarged; rostrum feebly widened towards apex20. *CARIDERUS* Muls.
 Antennae with last 4 or 5 joints enlarged; apex of rostrum much widened.
 21. *RHINOSIMUS* Latr.

1. *ISISTRIA* Lewis.

A monotypic genus from Japan, *I. rufobrunnea* Lew.

2. *SOSTHENES* Champ.

Type, *S. dyschiriooides* Champ.; Guatemala.

Salpingus niponicus Lewis and *Lissodema myrmido* Mars., both from Japan, have an abrupt 3-jointed club to the antennae, and the sides of the thorax rounded, not denticulate; I am unable to separate them generically from *Sosthenes*.

3. *NEOSALPINGUS* Blackb.

Blackburn says of this genus: "from *Lissodema* it is at once separated by its very different tarsi, which are shorter and stouter, with the apical two joints conspicuously more slender than the rest, which are densely clothed beneath with long hairs, the basal joint of the hind tarsi being scarcely longer than the second." This tarsal structure I believe to be merely a sexual character of the male and without generic significance. In the type of Blackburn's first species, *N. corticalis*, it is scarcely evident, and a second specimen in the B.M. collection with similar tarsi is evidently a female with the ovipositor extruded. In the type of *N. dentaticollis* it is much more evident, though even here the tarsi are not so strongly expanded as in *S. aeratus* Muls., ♂. Again, the British Museum possesses a specimen, also from Adelaide, indistinguishable from the type except that it has simple tarsi; this I take to be the ♀ *N. dentaticollis*. *Neosalpingus* Blackb. therefore merges into *Lissodema*, except that in *N. corticalis* the sides of the thorax are not denticulate, as they are in *N. dentaticollis*. If we retain *N. corticalis* as the type, the genus may be maintained on this latter character, *Salpingus hybridus* Er. being included in it, while *N. dentaticollis* Blackb. is referred to *Lissodema*. The other species placed by Lea (Trans. Roy. Soc. S. Austr. xli, 1917, pp. 159-161) in *Neosalpingus*,

viz. *N. (Corticaria) politus* Macl., *N. serraticollis* Lea, *N. obscuripennis* Lea and *N. triforeicollis* Lea, must also be referred to *Lissodema*. Specimens from Tasmania that I identify from the description as *N. obscuripennis* Lea, appear to be inseparable from the type of *L. frigidum* Blackb.

4. *Lissodema* Curt.

Type, *L. cursor* Gyll.

Stenolissodema Desbr. (type, *L. lituratum* Costa) was separated as a subgenus on the characters given above, but it appears to me to be untenable as a distinct group; many of the Japanese species described by Reitter, Marseul, and Lewis would fall into *Stenolissodema*. A rather distinct group is composed of *L. lewisi* and *L. andrewesi* (described below), together with *L. politum* Macl., characterised by the strongly marked club of the antennae and by the smooth, scarcely visibly punctate elytra, with scattered erect hairs. This group forms a connecting link with *PlatyliSSIDEMA*, but it does not seem advisable to separate them from *Lissodema*.

Lissodema ceylonicum, n. sp.

Elongate, nitid, sparsely setose, piceous, with the basal half of the antennae and the tarsi paler. Head rather feebly convex; rostrum short, the sides straight, strongly converging so that the front edge of the clypeus is little more than half as wide as the distance between the eyes; supra-antennal carinae raised; clypeus swollen, defined posteriorly by an arcuate sharply-marked impression; surface of head with large, not very closely placed punctures, some (? all) of which bear a single erect hair. Thorax nearly as long as broad, widest a little in front of the middle, evenly convex from side to side; each lateral margin with 5 setigerous tubercles; disc with large coarse punctures, which towards the middle line are somewhat smaller and elongate; a little within each basal angle is a deep but not very large fovea. Elytra elongate, little wider at the shoulders than the thorax, slightly broader behind the middle; lateral carina visible throughout when viewed from above; punctures in regular rows, not very closely placed, moderately coarse in basal half, but not nearly so large as those of the thorax, the rows substriate with convex intervals, behind the middle becoming almost obsolete; the surface is set with a few scattered erect hairs.

Length $1\frac{1}{2}$ mm.

Hab. CEYLON, Horton Plains, Dikoya, Balangoda, Bogawantalawa (*G. Lewis*).

A single specimen from each locality, the one from Bogawantalawa having a very much finer puncturation of the head and thorax: as the punctures are not more numerous, they appear more widely spaced. Differs from *L. quadripustulatum* Marsh. in colour, in its much coarser

and sparser puncturation, and in the shape of the head. In form *L. ceylonicum* most closely approaches *Trichosphaeriestes fryi* (infra), the present insect having the 8th joint of the antennae not markedly wider than the 7th, the setae less numerous, the colour different, etc.

Lissodema dentigerum, n. sp.

Elongate oval, castaneous, with the club of the antennae and the apical two-thirds of the elytra piceous. Rostrum short; supra-antennal carinae straight, convergent in front. Thorax transverse, widest a little in front of the middle; sides each with five teeth, of which the first (anterior) is small and blunt, the other four being very stout and almost equal in size, each tooth bearing on its apex a straight seta; disc evenly convex from side to side, coarsely and rather closely punctate, with a transverse impression before the base. Elytra widest behind the middle, sides rounded throughout; shoulders rounded, lateral carina completely visible from above; puncturation strong in basal half, gradually obsolescent towards the apex; punctures in rows, not very closely placed, becoming rather confused towards the base, especially in the scutellar area.

Length 2 mm.

Hab. JAVA (*Bowring*).

A single specimen. A stout, convex species, apparently most closely allied to *L. japonum* Reitt. and *L. minutum* Lewis, both from Japan. From the former it differs, *inter alia*, in its shorter antennae, the more coarsely punctured prothorax, and the less regular, somewhat confused puncturing of the elytra; in *L. japonum* the rows of punctures are impressed with slightly convex intervals. From *L. minutum* the present species is separable by the stronger lateral teeth of the prothorax, the coarse, though not crowded puncturing of the disc, the confused elytral puncturation, etc.

Lissodema lewisi, n. sp.

Flongate oval, nitid, testaceous, with the elytra paler except for a dark fascia across the middle which extends backwards along the suture, and a dark triangle at the base; the latter is due, in part at any rate, to the dark abdomen, where it is not covered by the folded wings, showing through the translucent elytra. Head rather sparsely punctate, the supra-antennal carinae sinuate, so that the rostrum is wider at the apex than at the points of insertion of the antennae; the latter moderately slender, the basal joint not very strongly inflated, joints 2-8 gradually decreasing in length, but all longer than wide, the last three joints very strongly incrassate and much darker in colour. Thorax transverse, widest before the middle, with five setigerous teeth, which increase in size from in front backwards, on each side; disc evenly convex from side to side, strongly but not closely punctate, with a strong transverse fovea or impression on each side before the base. Elytra oval, widest about

the middle, shoulders obtuse, lateral carina visible throughout; almost impunctate, but lines of fine punctures may be discerned many of which bear an upright golden hair.

Length $1\frac{3}{4}$ mm.

Hab. CEYLON, Kitulgalle (*G. Lewis*: Jan. 1882).

Approaches *Platylissodema* (*infra*) in its short, broad form and almost impunctate elytra, strongly pronounced antennal club, etc., but differs in lacking the impressed lateral border to the thorax. The following species from Southern India is a closely allied form.

Lissodema andrewesi, n. sp.

Very near *L. lewisi*, but a little larger; the thorax more closely, but more irregularly punctate, with smooth spaces free from punctures. In the middle of each elytron is a transverse oval spot; occasionally these meet on the suture, but in none of the specimens before me do they form a complete fascia or show any tendency to a backward prolongation along the suture.

Hab. S. INDIA, Nilgiri Hills, Ouchterlony Valley, January, April, and December, some on a woodstack, others under bark of a dead *Ficus* (*H. E.* and *H. L. Andrewes*).

The short series examined shows considerable diversity in colour, the head and thorax being almost piceous in some examples and pale reddish testaceous in others, the latter also have the club of the antennae flavescens. The puncturation, too, of the thorax varies considerably, the transverse basal foveae being sometimes very deep and confluent.

5. PLATYLISSODEMA, n. gen.

Head broad and flat, rostrum short, wider than long, expanded towards the apex; antennal grooves exposed from above, extending to the eyes; antennae with the basal joint inflated, much wider than the succeeding joints, 2nd and 3rd elongate, of almost equal length, 4th to 8th successively shorter, 9th to 11th strongly thickened, forming a large, loosely-articulated club. Prothorax transverse, lateral margins each with five small teeth, of which the last is the largest, and, projecting laterally far beyond the basal foramen of the thorax, takes the place of the posterior angle; above the marginal denticulations is a fine somewhat irregularly-impressed line, or series of short lines; disc moderately convex, nitid, punctate, with a large fovea on each side before the base. Elytra ovate, convex, disc smooth and nitid, punctures and striae almost obsolete, lateral margins invisible from above; humeri subrectangular; epipleura vanishing before the apex.

Platylissodema may be regarded as intermediate between *Lissodema* and *Platysalpingus*, nov. From the former it differs in having the sides of the thorax with what may be considered a rudimentary marginal line, the elytra smooth, almost impunctate, with a few

scattered upright hairs, and the antennal club more strongly pronounced. From the latter it may be distinguished by its short rostrum and the incompletely developed marginal line of the thorax.

The type is the species, redescribed below, that I take to be *Lanthanus rouyeri* Pie.

Lissodema laevipenne Mars., which must also be included in this genus is more elongate than *P. rouyeri* and has the thorax less transverse and more strongly and more evenly punctured on the disc, the elytra distinctly though finely punctate, etc.

Platylissodema rouyeri Pie.

Lanthanus rouyeri Pie, Mél. exot.-entom. fasc. xi, 1914, p. 17.

The following is an amplified description of an insect that I have little hesitation in referring to this species; the antennal structure differs remarkably from that of the Central and South American genus *Lanihanus* Champ. If I am in error in assuming this identity, the present species may be known as *P. bryanti*, sp. n.

Ovate, nitid, sparsely setose, head and thorax brassy-black, elytra piceous, each with a large fulvous spot behind the shoulder and another towards the apex. Head moderately strongly, not very densely, punctate; antennal joints 1-3 testaceous, 4-8 piceous, 9-11 black. Thorax more strongly but irregularly punctate, with a group of very large punctures on each side of the disc. Elytra smooth and nitid, with scattered erect golden hairs. Underside and femora piceous, tibiae and tarsi paler.

Length 1½ to 3 mm.

Hab. BORNEO (S.E.: German Mission), Mount Matang, W. Sarawak (*G. E. Bryant*); PENANG (*G. E. Bryant*). Under loose bark of felled trees.

The elytral spots vary considerably in extent, the two subapical ones occupying almost half the elytra in one of the two specimens from S.E. Borneo; in others these spots are so obscure as to be hardly visible. *L. rouyeri* was described from Java.

This species bears a very close resemblance to *Platysalpingus albonotatus* Pie, from the Kei Isls., and to *Lanthanus variegatus* Champ., from Central America. From the former it differs in its short rostrum, from the latter in its antennal structure (see table of genera).

6. PLATYSALPINGUS, n. gen.

Head sunk in prothorax almost to the eyes; rostrum long, antennae inserted in lateral grooves towards the base; basal joint of latter inflated, 2nd almost as long as 3rd, 4th to 8th successively shorter, last three joints

greatly enlarged, forming a sharply-defined club; eyes lateral, entire; oval, more prominent behind than in front. Thorax transverse; sides rather rounded in front, more or less sinuate towards posterior angles, finely margined throughout, except the lateral portions of the base; anterior angles obtuse, depressed, posterior angles sharply rectangular or acute; base truncate or feebly bisinuate, almost as wide as base of elytra. Elytra ovate, widest a little behind the middle, finely and irregularly punctured, or punctures obsolete. Wings ample. Pygidium exposed beyond the apex of the elytra. Tarsi simple, penultimate joint smaller than antepenultimate, claw-joint of posterior tarsi about as long as the basal joint.

Type, *Rhinosimus wallacei* Pasc.

The members of this genus bear a superficial resemblance to the Cucujid genera *Rhinomalus* and *Rhinophloeus* of Tropical America.

Platysalpingus differs from *Rhinosimus* in the form of the prothorax and in the structure and position of the antennae. It is closely allied to *Platylissodema* (supra), differing mainly in the longer snout and the more regularly marginate sides of the prothorax. In *Platylissodema* the rostrum is flat, not much constricted in the middle, and not much produced in front of the insertion of the antennae, i.e. the apex of the basal joint of the antennae reaches up to the apex of the elytral base; in *Platysalpingus* it is slightly curved downwards and prolonged very much beyond the apex of the first antennal joint.

The genus is known, so far, only from the New Guinea region.

Key to the Species.

1. Elytra unicolorous, violet, or piceous with violet reflections, distinctly and irregularly punctate; lateral margins of thorax evenly defined throughout *wallacei* Pasc.
? = *coeruleus* Pic.
Elytra piceous, each with a large flavous spot near the base and another towards the apex; sides of thorax unevenly impressed 2.
2. Basal spots of elytra approximate *approximatus*, n. sp.
Basal spots of elytra distant, subhumeral 3.
3. Rostrum longer, about five times as long as wide *longirostris*, n. sp.
Rostrum shorter, about twice as long as wide *albonotatus* Pic.

N.B.—*Rhinosimus corticalis* Olliff, from Queensland, is not known to me, but it appears to be allied to *P. longirostris* in the above key.

Platysalpingus longirostris, n. sp.

Ovate, nitid, almost glabrous; dark piceous, the thorax with a faint aeneous tinge, the elytra each with two pale testaceous spots, one transversely oval situated behind the shoulders, the other obliquely oval towards the apex. Rostrum very long, five or six times as long as its width at the points of insertion of the antennae, expanded near the apex. Thorax widest before the

middle, the sides rounded in front, sinuate towards the base and finely margined throughout; disc evenly convex, with two deep oblique foveae before the base; the median area has very coarse punctures, with a group of smaller ones on each side in front of the fovea; towards the sides and the basal angles the punctures become very minute and sparse. Elytra ovate, the piceous area finely, almost obsoletely, punctulate, the pale spots free from punctures. Legs piceous, the tarsi paler.

Length 2½-5 mm.

Hab. NEW GUINEA, Dorey (*Wallace*).

Closely allied to *P. wallacei*, from which it differs in colour and in the longer rostrum.

Platysalpingus approximatus, sp. n.

Closely resembling *P. longirostris* and *P. albonotatus*, but with the basal spots of the elytra situated closer to the suture. Rostrum intermediate in length between that of *P. longirostris* and *P. albonotatus*, the sides of the thorax very obscurely denticulate, again intermediate between the two species named. Puncturation of the thorax very coarse, covering a triangular area from the middle of the base to near the anterior angles, the punctures being largest towards the apex of the triangle and decreasing forwards and laterally.

Length 3 mm.

Hab. GILOLO, Morty (*Wallace*).

Platysalpingus albonotatus Pie.

Lanthanus albonotatus Pie, Mél. exot.-ent. fase. xi. 1914, p. 17.

The British Museum possesses a single specimen from Amboyna (*Wallace*) that I refer to this species, the type of which was from the Kei Islands.

In colour and markings it closely resembles *P. longirostris* (supra), but differs in the shorter, stouter rostrum, which is only about double as long as its width at the points of insertion of the antennae. The sides of the thorax are bluntly denticulate, each with four teeth bearing a single stiff hair; the last of these is much more developed than the others and forms the posterior angle of the thorax. In this respect *P. albonotatus* forms a transition stage between *Platyssodema* and *Platysalpingus wallacei*, in which the lateral teeth, with the exception of that forming the posterior angle of the thorax, are obsolete, though represented by their setae.

7. *LANTHANUS* Champ.

Remarkable for its antennal structure. Besides the two Central American species placed here by Champion, Pie has added *L. brasiliensis*

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from Brazil and *L. latissimus* from Bolivia. Two Oriental forms added by the last-named author almost certainly have nothing to do with the present genus and are considered above.

JUN 20 1919

10. NOTOSALPINGUS Blackb.

This genus was characterised for the reception of a single Australian species, *N. ornatus* Blackb., which differed from *Salpingus* mainly in the structure of the tarsi, "of which the apical joint is as long as all the rest together, the penultimate much narrower than the preceding joints, and the first not much longer than the second." This tarsal structure is of very doubtful value as a generic character, but the genus may be maintained on account of its pilosity, the shape of the thorax, the sides of which are obscurely denticulate, etc.

Lea has since added four species, one from King Id. and three from Lord Howe Id.; all of these are unknown to me, but the following is almost undoubtedly distinct from them:—

Notosalpingus parvulus, n. sp.

Elongate oval, moderately nitid, sparsely pubescent, pitchy-brown, with the base of the antennae, the tibiae, and tarsi paler. Head and thorax strongly punctate, the latter transversely cordate, not very convex, the sides obscurely denticulate. Elytra in the anterior half with tolerably regular rows of strong punctures, these becoming much smaller towards the apex.

Length 1·5 mm.

Hab. W. AUSTRALIA [Nov. Holl. Occid.] (*du Boulay*).

A single specimen in the Fry collection. It is the first species to be recorded from Western Australia. This may possibly be synonymous with *N. metallicus* Lea, from Lord Howe Island, with which (*ex descr.*) it agrees in size and colour, but the widely different localities render this identity improbable.

11. TRICHOSPHAERIESTES, n. gen.

Near *Sphaeristes*. Body pilose. Head inserted in the thorax as far as the eyes; rostrum short, sides convergent anteriorly, dorso-lateral carina straight, antennal grooves scarcely visible from above, abutting upon the eyes; antennae stout, 2nd joint as long as and stouter than 3rd, 3rd to 6th of equal thickness, thence increasing to 9th, 9th to 11th also equal. Thorax subcordate, evenly convex, rather rounded in front, the lateral margins with a few small setigerous tubercles. Elytra convex, widest behind the middle, lateral margins visible from above almost throughout, epipleura evanescent behind.

The single species assigned to this genus differs from the hairy Chilian forms referred by Fairmaire to *Salpingus* (*S. variegatus*, etc.)

in its stouter, more convex form, the head more deeply sunk in the prothorax, the dissimilar antennae, etc., as well as in having setigerous tubercles on the sides of the thorax.

Trichosphaeristes fryi, n. sp.

Elongate-oval, convex, setose, uniformly testaceous; antennae stout, thickened towards the apex, last three joints not forming a sharply-defined club. Prothorax evenly convex, without marked depressions, coarsely but not very closely punctate; the sides immarginate, with minute scattered setigerous tubercles. Elytra transversely depressed behind the base, with rows of setigerous punctures not very closely placed; these punctures, very large on the anterior half of the elytra, become much smaller behind the transverse depression.

Length $2\frac{3}{4}$ mm.

Hab. BRAZIL, Rio de Janeiro (*Fry*).

Two specimens of indeterminate sex in the Fry collection. This is apparently the first species of the group to be recorded from the eastern side of the South American continent, and it cannot well be confused with any other described form.

13. *Oncosalpingus*, n. gen.

Allied to *Sphaeristes* Steph. (= *Salpingus* auett.). Body pilose: the hind legs of the ♂ remarkably modified. Rostrum short, not evidently widened towards the apex, the dorso-lateral carina feebly emarginate above the insertion of the antennae, the lateral grooves moderately visible from above and abutting upon the eyes. Antennae slender, gradually thickened towards the apex; 2nd joint equal to 4th, a little shorter than 3rd, 6th to 10th ovate, 11th half as long again as the 10th. Elytral epipleura incomplete, vanishing about the level of the third abdominal segment.

♂. Coxae of posterior legs produced ventrally into a rounded tooth or lobe; femora inflated, subpyriform; tibiae very stout, arcuate in basal half, the curve being produced inwards into a stout subconical tooth, the apical half straight, bent outwards at the base of this tooth; intermediate tibiae sinuate on inner side.

The occurrence of this type of leg-structure in yet another family of the Heteromera is interesting, particularly in one in which secondary sexual characters are so little in evidence as they are in the *Pythidae*. Inflated hind femora are most freely developed in the *Oedemeridae* (e. g. *Oedemera*, *Oncomera*, *Selenopalpus*, etc.), but they are present in certain *Meloïdae* (*Horria*), *Melandryidae* (*Osphya*), and *Xylophilidae*. In all cases the character appears as a sexual modification of the male, and is not correlated with any power of leaping, as is the thickened femora of the *Halticidae*, of *Orchestes*, *Scirtes*, etc., where it is common to both sexes.

Oncosalpingus podagricus, n. sp.

Elongate-oval, setose, piceous, with yellow markings on the elytra and the base of the antennae, the palpi and legs testaceous. Head about as long as its width across the eyes, the latter being distant more than their own width from the front of the thorax. Thorax a little longer than wide, subcordate, with a pair of extensive though shallow depressions before the base; the disc moderately strongly and closely punctate. Elytra elongate-ovate, slightly wider behind the middle; shoulders rounded, subrectangular; lateral margins visible from above, except at the shoulders; disc with an oblique transverse depression behind the base; strongly, rather irregularly seriate-punctate, the punctures becoming smaller behind and each bearing a suberect hair; they have a large, dark, triangular, common basal spot, a postmedian dark band of somewhat zigzag form, with a large backwardly-directed flexure on each, and a common dark triangular apical patch, the ground-colour being yellowish. The sexual characters of the posterior legs have been noted above under the generic diagnosis.

Length 4-4½ mm.

Hab. CHILE (*Reed*).

Three examples, all ♂♂, in the Fry collection. They closely resemble *Salpingus variegatus* Fairm. et Germ., also from Chile, in the elytral markings, but are very much larger, the head is more elongate, particularly behind the eyes, the puncturation is stronger, and the pubescence shorter, especially that of the antennae. Of *S. variegatus* there is only one specimen, marked "type," in the Museum collection. On account of the above-noted points of difference, this can scarcely be the ♀ of *O. podagricus*, but it may possibly have to come in the same genus.

14. *SPHAERIESTES* Steph.

In its unrestricted sense an extensive genus of world-wide distribution. Mulsant, in studying the European species, separated two genera, viz., *Rabocerus* [type, *S. mutilatus* Beck (= *S. foreolatus* Muls. nee Ljungh.*]) and *Colposis* (type, *S. virescens* Muls.); later, Pie proposed a subgenus, *Pseudorabocerus*, for *Rabocerus lederi* Reitt., an insect unknown to me; and more recently Reitter has formed the subgenus *Salpingellus* for *Sphaeriestes ater* Payk. and *S. reyi* Ab. The value of this latter division seems to me very dubious, some of the palaeoarctic species occupying an intermediate position between the two (e. g. *S. aeratus* Muls. and *S. impressus* Woll.) Of the numerous exotic forms, especially those from New Zealand and Madagascar, too few are known to me to warrant the formation of new genera, and for the present I must retain them all under *Sphaeriestes* sensu lato.

* Cf. Blair, Ent. Mo. Mag. (3) iv, 1918, pp. 77-84.

19. VINCENZELLUS Reitt.

Type, *Rhinosimus viridipennis* Latr., an insect that has been the source of endless confusion owing to its similarity in colour with *R. ruficollis* L. Indeed, its inclusion in *Rhinosimus* at all seems to be wholly due to this similarity.

In 1868, Schmidt-Goebel (Stett. Ent. Zeit. xxix, p. 380) published a very useful paper clearing up the synonymy of these two species, and stated that *R. viridipennis* was a true *Salpingus (Sphaeriestes)*. While this conclusion remains open to question, it certainly does seem clear that it is not a *Rhinosimus*, and that a separate genus is required for its reception. It may be noted in passing, that Schmidt-Goebel, in the paper above cited, while referring to *Anthribus roboris* F. (Ent. Syst., Suppl. 1798, p. 161, and Syst. Eleuth. i, 1801, p. 410), omits any reference to the earlier *Cureulio roboris* F. (Mantissa Insect. i, 1787, p. 100). This latter insect is certainly not the *Anthribus roboris* of the later works (= *R. viridipennis* Latr.), but is the species redescribed by Paykull (1792) (= *R. ruficollis* L.), and should be included among its synonyms.

Evidence has recently been brought forward by Hardy ("Lancashire Naturalist," viii, 1916, p. 344) to prove that *T. viridipennis* Latr. and *R. ruficollis* L. are merely sexes of the same species, the latter being the ♀. Sharp and Muir, however, describe the genitalia of the ♂ of *R. ruficollis*, and on dissecting specimens I have found both sexes of each of them.

R. aeneirostris Mannerh. and *R. anthracinus* Fairm. and Germ. both come within this genus.

R. valdivianus Phil. is apparently very similar (*ex descr.*) to *R. anthracinus*, but has a longer rostrum and a 3-jointed club to the antennae, and consequently would seem to require a new genus intermediate between *Neosalpingus* and *Platysalpingus*.

London.

March 1919.

A NOTE ON THE BRITISH SPECIES OF *SPHAERIDIUM*.

BY D. SHARP, M.A., F.R.S.

Five years ago Dr. Joy pointed out that we have three species of *Sphaeridium* in England, although only two are recognised as European by recent writers. In coming to this conclusion he relied on the form of the male genitalia, but he also pointed out other characters of the exterior

that enable the species to be recognised with ease. The object of my note is to emphasise the correctness of Dr. Joy's valuable observation, and to give a few additional particulars resulting from the examination of 100 British examples of the genus.

I will not repeat Dr. Joy's brief table of the characters, for his paper must be referred to, not only because of its originality, but also because of his figures of the apex of the median lobe of the aedeagus. It appeared in this Magazine in April 1914, pp. 83 and 84.

I endeavoured to investigate the point last year, but as my material was not quite satisfactory, the matter was left over till the present spring, and on the 8th of this month noticing that *Sphaeridium* was running in some numbers on the fresh cowdung here I captured 26 examples. On examination it was found that 17 were males, and that all the three species were present, there being 9 *scarabaeoides*, 8 *quadrimaculatum*, and 9 *bipustulatum*.

The aedeagus of most of the specimens has been studied, and the result is to leave no doubt of the certain distinctness of the species. I will now give some brief particulars as to each of them.

1. *S. scarabaeoides* L.

This is the blackest species, the side margins of the thorax and the hind femora being entirely black, which is not the case in either of the other two forms.

The median lobe of the aedeagus is very parallel-sided, and its apex subtruncate, being only slightly rounded, with a very small acumen in the middle, the size of which is exaggerated in Joy's figure. The lateral lobes clasp the median lobe very closely, and are very slender and delicate at the apex. The peculiarities of the male front feet are very strongly developed.

The species varies a good deal in size, but only a little in colour, the red coloration near the shoulder of the elytra is generally very indefinite, but occasionally it is fairly well limited and distinct.

S. scarabaeoides is found both in England and Scotland.

2. *S. quadrimaculatum* Marsh.

Dermestes quadrimaculatus Marsham, Ent. Brit. i, p. 65.

This species on the Continent is apparently universally confounded with the preceding, but, as stated by Joy, it is distinguished from *S. scarabaeoides* by the sides of the thorax being (at any rate in front)

pallid in colour. The legs are paler, the hind femora being yellow, with a more or less extensive dark patch on the middle.

The median lobe of the aedeagus has the apical third gradually narrowed to the tip, so that this part of it is quite pointed and dagger-like. The lateral lobes are slender, delicately and gradually narrowed and pointed.

The species also varies in size, and it appears to be on the average rather smaller than *S. scarabacoides*. The colour is also rather variable, and occasionally the yellow of the sides of the thorax becomes so much diminished as to suggest that a variety with concolorous black thorax may exist. The red mark on the elytra is usually definite and conspicuous.

I think Dr. Joy is correct in referring Marsham's description of *Dermestes quadrimaculatus* to this species, but as there is a prior *4-maculatus* of Seriba, Marsham's name is not certainly established. It occurs in both Scotland and England.

3. *S. bipustulatum* Fab.

This is correctly distinguished from the other two (confounded as one) in literature; it is, however, an extremely variable species in colour, and less so in shape and sculpture. Many names have been proposed for the variations, and are given by Ganglbauer and Reitter.

The aedeagus is quite characteristic: shorter than in the other species, it is bluntly pointed, and the lateral lobes are clumsy, thick, and quite blunt apically. The male front feet are much smaller than they are in the other two forms.

S. bipustulatum is abundant in both England and Scotland, and notwithstanding its great variation is easily recognised. All the nine specimens found by me here on the 8th inst. are of one form.

I may conclude by alluding to a point that has hitherto escaped observation, viz. the very peculiar female genitalia. There is a complicated, rather large structure at their termination, with which is connected an elongate contorted gland. This suggests some spinning-apparatus, and the tip of the female abdomen is sometimes sealed by an exudation.

Nothing is known as to the life-history, beyond Schiödte's somewhat meagre account of the larva. I expect it will prove to be interesting when discovered.

Brockenhurst.

May 15th, 1919.

ON THE AQUATIC COLEOPTERA, ETC., OF THE TRENT VALLEY
IN THE NEIGHBOURHOOD OF LONG EATON.

BY H. H. WALLIS, M.A. (Cantab.).

The district under consideration consists of a strip of low-lying ground, less than 100 feet above sea-level. The sub-soil is alluvium or Bunter sandstone with pockets of alluvial gravel. The greater part of the area is liable to heavy floods. Running streams with gravelly bottoms are not met with, and most of the collecting has been done in ditches and ponds. The three counties of Derbyshire, Leicestershire, and Nottinghamshire meet in about the centre of the area collected over, there being no definite geographical boundaries between them, and the district is a fairly distinct natural region. My collecting has seldom extended into Nottinghamshire, but I feel sure that several species unrecorded in Professor Carr's "Fauna of Nottinghamshire" and which I have found within a mile of the county boundary must have established themselves in that county. Professor Carr has told me that the water-beetles of Nottinghamshire have been very little worked, which probably accounts for the paucity of the records of the *Hydrophilidae*.

I do not suggest that the records below are by any means complete: my collecting has been done during the War, at times when my duties gave me an occasional free hour, but they may be of some value to a Coleopterist working in a district I have now left.

The open-air swimming-bath at Trent College yielded about twenty-five species. Most of these must have been "visitors," as the water with which the bath is filled comes from a well and the bath is emptied and cleaned in the Spring. The bath is lined with glazed tiles, which do not seem to be likely quarters for beetles which pass the winter months in the imaginal state. These visitors came from some distance, as the only stream in the immediate neighbourhood of the college never yielded me a beetle. Among them may be mentioned *Dytiscus circumcinctus*, which, I think, is a new record for the Midlands, and *Haliphus mucronatus*.

In the list below, the letters D., L., and N. refer to the counties Derbyshire, Leicestershire, and Nottinghamshire, in which specimens were taken.

HALIPLIDAE:

Brychius elevatus Pz., scarce, L. *Haliphus mucronatus* Steph., 1 specimen, D.; *H. fluviatilis* Aub., abundant, L. D. N.; *H. wehnckeii* Gerh., scarce, D.; *H. ruficollis* De G., abundant, L. D. N.; *H. lineatocollis* Marsh., abundant, L. D. N.

DYTISCIDAE:

Noterus clavicornis De G., locally common, L. *Laccophilus interruptus* Pz., common, N. D.; *L. obscurus* Pz., common, D. *Hyphydrus ovatus* L., abundant, N. L. D. *Coelambus versicolor* Schall., D.; *C. inaequalis* F., D. L.; *C. confluens* F., scarce, L. *Deronectes assimilis* Pk., locally abundant, D.; *D. 12-pustulatus* F., scarce, D. *Hydroporus pictus* F., common, D.; *H. dorsalis* F., scarce, L.; *H. lineatus* F., L. N. D.; *H. palustris* L., L. N. D.; *H. erythrocephalus* L., D.; *H. pubescens* Gyll., D.; *H. planus* F., D. L.; *H. lituratus* F., not common, D. *Ayabus paludosus* F., abundant, D.; *A. nebulosus* Forst., abundant, D. L.; *A. sturmi* Gyll., D. L.; *A. bipustulatus* L., a number of chestnut-coloured specimens were taken in 1914 in the college bath: I have not seen others since. *Ilybius fuliginosus* F., D. L. N.; *I. obscurus* Marsh., locally very abundant, L. *Rhantus pulverosus* Steph., 1 specimen, D. *Colymbetes fuscus* L., very abundant 1914 and 1918, but seldom seen in the intervening years, D. *Dytiscus marginalis* L., D.; *D. circumcinctus* Ahr., 1 specimen, D. *Acilius sulcatus* L., abundant, D.

HYDROPHILIDAE:

Hydrobius fuscipes L., common, D.; *H. fuscipes* var. *aeneus* Sol., less common, D. *Philhydrus testaceus* F., D.; *P. melanocephalus* Ol., scarce, L.; *P. nigricans* Zett., scarce, D. *Anacuena globulus* Pk., abundant, D. L.; *A. limbata* F., abundant, D. L. *Laccobius alutaceus* Th., abundant, D. L.; *L. minutus* L., scarce, D.; *L. bipunctatus* F., D. *Limnebius truncatellus* Thunb., D. L.; *L. nitidus* Marsh., scarce, D. *Helophorus aquaticus* L., abundant, D. L. N.; *H. aquaticus* var. *aequalis* Th., abundant, D. L.; *H. brevipalpis* Bed., abundant, D. *Hydruena riparia* Kug., scarce, D.; *H. nigrita* Germ., scarce, D.

In addition, the following *Carabidae* are new to the Nottinghamshire list as given in Carr's Fauna of the County:—I took a few examples of *Bembidium articulatum* Pz. at Colwick in June 1918. *Clivina collaris* Hbst. also occurred: this beetle has only once before been recorded in Notts, when Mr. Ryles found one specimen by the side of the Trent. *Anchomenus thoreyi* Dj. is also new to the county, I believe.

The Grammar School,
Bradford.

May 5th, 1919.

EPURAEA DISTINCTA GRIMMER, A BEETLE NEW TO BRITAIN.

BY J. W. ALLEN.

I am pleased to be able to record the capture of examples of this species in the Gower peninsula of Glamorgan. The first specimens seen were knocked out of a fungus growing on a tree in a small wood in Oxwich Bay on April 12th last. Subsequently Dr. Nicholson, Mr. Tomlin, and myself found the beetle both in the woods of Penrice and in the centre of the peninsula at Reynoldston, and always in the

same fungus, which is, I think, a *Duedalea*. The beetle was found only in this particular fungus, and is the sole species of *Epuraea* that we saw.

It was identified by us as *Epuraea distincta* Grimmer, and the determination has been confirmed by Mr. Champion, to whom all the specimens in our possession were sent. The following are the most distinctive characters: the thorax is broadest behind the middle, and is suddenly and deeply excised on either side, in front of the posterior angles, which form almost right angles; the elytra are somewhat parallel-sided, with moderately broad lateral margins and rounded apex, and are suffused with dark markings, which were very obvious during life; the antennae have the club slightly infuscate, and the last joint almost as broad as the penultimate; the intermediate tibiae of the ♂ are emarginate in the middle within, the emargination terminating in a tooth. Length 2-3 mm. *Habitat*: Mid-Europe, France, Italy, Ural, Baikal.

Superficially *E. distincta* closely resembles *E. obsoleta* F., but is easily distinguished from it, as well as from all the other British species, by the emargination of the sides of the thorax.

Great quantities of wood are brought to Swansea and to Burry Port on either side of the Gower for use in coal mines. The wood comes mainly, I understand, from South France and from Norway. A large amount of driftwood from these countries is cast up on the Gower coast. It is just possible that the species has been introduced in this manner more or less recently; if so, it would seem at least to be very well established in its new home.

266 Willesden Lane, N.W. 2.

May 1919.

NEW AND LITTLE-KNOWN SALTATORIAL DASCILLIDAE:
SECOND SUPPLEMENTARY NOTE.

BY G. C. CHAMPION, F.Z.S.

On pp. 26, 27, *ante*, two *Scirtes*, from Fiji, were added to those enumerated by me in the 1918 Volume of this Magazine. The very fine collection of Coleoptera made by the late lamented H. C. Dollman in N. Rhodesia in 1913-15, recently presented by his father to the British Museum, contains representatives of several new species of the same genus, and the opportunity is now taken to describe them, as well as another *Scirtes* found by Mr. Neave on the shore of the Victoria Nyanza. These African forms should be added to my last year's paper, between Nos. 25 and 26.

Scirtes quadripustulatus, n. sp.

Broad-oval, robust, convex, shining, thickly, rather coarsely pubescent; black, the elytra each with a large transverse patch at the base (extending from near the suture to the outer margin), and a transverse, oval spot on the disc beyond the middle, testaceous; the antennae black, with joints 1-3 (except 1 above), and the extreme apices of 4 and 5, testaceous, the ventral surface obscure ferruginous, the legs testaceous, with the femora and tibiae partly infuscate; densely, minutely, the elytra more distinctly, punctate. Head short, broad, the eyes large; antennae moderately elongate, slender, joints 2 and 3 short, equal in length, 4-11 each nearly twice the length of 3. Prothorax rapidly narrowed from the base, hollowed in front opposite the eyes. Elytra without trace of raised lines, the margins narrowly expanded. Ventral segment 5 triangularly emarginate at apex. Posterior coxal plates angulate. Posterior legs very stout; the tibiae not very long, feebly curved, and sharply carinate, the upper spur curved, nearly as long as the first tarsal joint, the lower one short.

Length $4\frac{1}{4}$, breadth 3 mm.

Hab. N. RHODESIA, Namaiila (*H. C. Dollman*: 30.viii.1914).

One specimen, probably ♂. A species very different from any other known African *Scirtes*, and resembling a 4-spotted Coccinellid.

Scirtes bifidus, n. sp.

Broad-oval, somewhat pointed behind, convex, shining, closely, finely pubescent; black, the base of the elytra broadly, indeterminately rufescent, the reddish colour extending narrowly down the suture and forward on to the scutellum and a narrow space in front of it on the prothorax, the antennae wholly testaceous, the ventral surface obscure ferruginous, the legs testaceous, with the femora more or less infuscate; densely, minutely, the elytra more distinctly, punctate. Head broad; antennae moderately long, rather slender, joint 3 very short, scarcely as long as 2, the others not very elongate. Prothorax rapidly, arcuately narrowed from the base, the anterior angles deflexed, obtuse. Elytra without trace of raised lines, narrowly margined, the apices slightly produced. Posterior coxal plates angular. Posterior legs very stout; the tibiae feebly curved and sharply carinate, the upper spur almost straight, cleft at the tip (as seen in profile), and nearly as long as the first tarsal joint, the lower one short.

Length 3, breadth $2\frac{1}{2}$ mm.

Hab. N. RHODESIA, Mwengwa (*H. C. Dollman*: 6.viii.1913).

One specimen. A convex, broad-oval form, black above, with the base of the elytra indeterminately suffused with red, the antennae wholly testaceous, and the upper posterior tibial spur cleft at the tip. This is the second species known to me with a peculiarly shaped tibial spur, the other being *S. subulatus* from the Niger. Compared with *S. 4-pustulatus*, the antennae in the present species are less elongate. In general facies *S. bifidus* is not unlike the Bornean *S. ephippiatus*.

Scirtes dollmani, n. sp.

Oblong-elliptic, robust, shining, thickly clothed with rather coarse pallid pubescence; rufo-testaceous, the elytra slightly infuscate towards the sides and apex, the abdomen black at the tip; the antennae black, joints 1-3 and the legs testaceous, the posterior femora in great part infuscate; densely, very finely punctate. Antennae long, rather slender, joints 2 and 3 short, equal, 4-11 filiform. Prothorax arcuately narrowed from the base, the anterior angles deflexed and somewhat prominent. Elytra oblong-oval, slightly flattened and with an indication of faint raised lines on the disc, narrowly margined. Posterior coxal plates angular. Legs rather long; posterior tibiae almost straight, sharply carinate, the upper spur nearly as long as the first tarsal joint, hooked at the tip.

Length nearly 4, breadth 2½ mm.

Hab. N. RHODESIA, Namwala (*H. C. Dollman*: 21.iii.1913).

One specimen. A robust, oblong-elliptic form, rufo-testaceous in colour, with the antennal joints 4-11, the posterior femora in part, and the apex of the abdomen black. It is not very closely related to any of the African species of the genus represented in the Museum.* In general facies *S. dollmani* approaches *S. vittifrons* and *nigeriensis*; but it is more elongate and very differently coloured, and the entire upper surface is densely, very finely punctured.

Scirtes microcaroides, n. sp.

♂. Oblong, rather narrow, depressed, shining, finely pubescent; testaceous, the base of the head and a transverse mark on the disc of the prothorax infuscate, the eyes and the antennal joints 4-11 black; densely, very finely punctate. Head broad, the eyes rather convex; antennae very long, nearly reaching the middle of the elytra, rather slender, joints 2 and 3 short, subequal, the others filiform. Prothorax rounded at the sides, gradually narrowed from the base, the anterior angles deflexed and rather sharp. Elytra long, narrowly margined, obsoletely subcostate on the disc. Posterior coxal plates angular. Legs elongate; upper posterior tibial spur curved, simple, nearly as long as first tarsal joint.

Length 3½, breadth 1⅔ mm.

Hab. N. RHODESIA, Mwengwa (*H. C. Dollman*: 27.x.1913).

One male, with the slender trilobate genital armature partly exposed. This species, owing to its oblong depressed form, has the general facies of a small *Microcara*. Smaller and narrower than *S. helodinus* (type ♀), from Lari, British E. Africa, the eyes less depressed, the antennae a little less elongate, the prothorax more rounded at the sides behind, the elytra feebly costulate. *S. katanganus* Pic (1915), from Katanga, in the Congo Region, is doubtless related to these insects.

* The descriptions of *S. rufescens* and *alluaudi* Pic (1915) have not yet been seen by me.

Scirtes rhodesiae, n. sp.

♀. Oblong-oval, rather broad, somewhat depressed, shining, thickly clothed with coarse pallid pubescence; testaceous or obscure testaceous, the head, joints 4-11 of the antennae, prothorax, and posterior knees more or less infuscate; densely, very finely, the elytra a little more coarsely and not so closely, punctate. Antennae moderately long, very slender, joints 2 and 3 short, equal, 4-11 filiform. Prothorax rapidly narrowed from the base. Elytra with an indication of faint raised lines on the disc, narrowly, sharply margined. Posterior coxal plates angular. Legs long; upper spur of posterior tibiae simple, shorter than the first tarsal joint.

Length $4\frac{4}{5}$ - $5\frac{1}{2}$, breadth 3 mm.

Hab. N. RHODESIA, Namwala (*H. C. Dollman*: 30.iii. and 1.iv.1913).

Two females, each with ovipositor extruded. Intermediate in size between *S. subcostatus* from Entebbe, Uganda, and *S. africanus* from Natal, differing from the former (type ♀) in the relatively shorter and more slender antennae and the less distinctly costulate elytra, which are also less rounded at the sides, and from the latter in the slender antennae, etc. *S. neavei*, infra, from the Victoria Nyanza, is another allied form.

Scirtes neavei, n. sp.

♀. Oblong, broad, depressed, shining, thickly clothed with pallid pubescence; reddish brown, the eyes, antennae (except joints 1-3, which are testaceous beneath and infuscate above), anterior and intermediate tibiae, posterior femora (except at the base), and sides and apex of abdomen, black; the entire upper surface densely, minutely punctate. Head rather small, the eyes large; antennae very long, moderately slender, joints 2 and 3 short, equal, together about as long as 4, 4-11 subfiliform. Prothorax rapidly narrowed from the base forward, deeply hollowed in front opposite the eyes. Elytra oblong, sharply margined, with a distinct, posteriorly evanescent sutural stria, and three faint raised lines on the disc. Ventral segment 5 broadly areolate-emarginate. Posterior coxal plates angular. Posterior tibiae slightly curved, carinate, the upper spur very long, shorter than the first tarsal joint.

Length 6, breadth $3\frac{1}{10}$ mm.

Hab. BRITISH E. AFRICA, East shore of Victoria Nyanza near Karungu (*S. A. Neave*: 28.iv.1911).

One specimen. Closely related to *S. subcostatus* (of which seven examples have now been seen by me *), from Uganda, but differing from that insect (type ♀) in having the elytra much less rounded at the sides, the general shape being oblong, and the entire upper surface densely, minutely punctate. *S. neavei* and the additional specimens of *S. sub-*

* Cf. ante, p. 27.

costatus have recently been found amongst the "accessions" in the Museum, as well as an abraded (?) ♂ *Scirtes* from Uganda which may represent yet another species? *

Horsell.

May 1919.

TENTHREDELLA FLAVICORNIS F. AT LICHFIELD.

BY THE REV. F. D. MORICE, M.A., F.E.S.

The inclusion of *Tenthredella flavicornis* F. (= *Tenthredo flava* adatt. nec L.*) among the British Sawflies has apparently rested hitherto entirely on certain statements of J. F. Stephens, and the existence of a specimen in the British Collection at S. Kensington, to which those statements probably refer. Exactly 90 years ago he listed the species as British in his "Systematic Catalogue," calling it *Allantus flavicornis*, giving no locality and mentioning no captor, but saying that it was in the British Museum. He also marked it with a †, indicating that he did not himself possess an example of the species. Afterwards in his "Illustrations," published in 1835—the year of Leach's death—he again records it as British and describes both sexes, saying that it was "Taken near Plymouth; apparently rare." This statement suggests, though it does not actually prove, that he supposed the specimen (or specimens?) in question to be among Leach's Devonshire captures.

W. F. Kirby's List (1882) of the Sawflies then in B.M. mentions a number of examples of "*Tenthredo flava* L.," all of which, except one for which he gives as locality "Britain," were Continental specimens received from Ruthe or Buecheher. And there is now in the "British Collection" a single example of the species, which, unfortunately, bears no label at all to indicate its origin, but which is presumably the actual insect referred to by Stephens (1829 and 1835) and W. F. Kirby (1882). Cameron also includes "*Tenthredo flava*" as a British species in his Monograph, but says that he had seen no British specimens except "those" (*sic!* but ?) rerecorded by Stephens.

I have always felt great doubt whether this old record could be trusted, and my doubts were increased by finding that the "Old Registers" of B.M. mention a specimen of the insect as having been placed in the Collection by Leach, who received it from Klug in Germany, and that there is no other specimen in the collections (either "British" or "General") to which this record can possibly refer! But apart from this, it seemed, and still seems to me, surprising that so

* The real *T. flava* of Linné seems to have been a *Hoplocampa*.

large and striking a species, the most conspicuously coloured and, except perhaps *T. maculata*, the largest of all our *Tenthredella* spp., if it was really taken in Devonshire about a century ago, should have never since been noticed in this country.

However, I can now certify that, independently of Stephens's record "from Plymouth," the species has really appeared, and that quite lately and in some numbers, in one of our Midland counties, namely, in the neighbourhood of Lichfield. Among a number of Sawflies sent to me thence for naming by Mr. L. A. Carr I was surprised to find a pair of *T. flavigornis*; and I have since learnt from him that they were taken by himself on an occasion which he perfectly remembers, on the estate of the late Mr. W. W. Worthington near Lichfield. Meeting by chance that gentleman's head-gardener, he was asked whether "big flies," which were appearing in great numbers, were likely to do damage to the trees. He at once set off to investigate the matter, and found a number of the insects, of which he took as many as he could, and asked the gardener to keep any others for him that might be met with. This was in the summer of 1912, but he had pursued the enquiry no further, thinking that the species was probably well known, and had merely kept the specimens till he should have an opportunity of getting them determined. He has now given me two magnificent pairs of these insects, which I had the pleasure of exhibiting at a recent meeting of the Entomological Society of London.

The only British species with any resemblance in size and colour to *flavicornis* F. is *maculata* Geoffr., the ♂♂ of which have abdomens broadly banded, as is that of *flavicornis* in both sexes, with a peculiar testaceous-yellow or orange, while their apices and basal segments (= *propodea*) are black. In the ♀♀ of *maculata* the actual colours are much the same, but the yellowish ring is much narrower. The two species, however, may at once be distinguished (1) by the colour of the antennae—black in *maculata*, bright orange in *flaviventris*; (2) by markings of the same colour on the mesonotum of *flaviventris*, while in *maculata* the mesonotum is simply black; (3) by the colour of the legs, those of *maculata* being much darker, e.g. all the femora much blackened, while those of *flaviventris*, except that the hind femora are blackened, are almost entirely yellow; (4) by the wings, which in *flaviventris* have clouded apices, contrasting noticeably with their glassy orange-veined basal and central areas, while in *maculata* the wings are equally transparent throughout, and the yellow of the veins, costa, stigma, etc., is, I think, in the ♀♀ especially, much more obscure, looking often almost brown.

In North-eastern Asia (Siberia, China, Japan, etc.) several *Tenthredella* spp. occur, which, much more than any European forms, resemble *flaviventris* in the coloration of their bodies and also of their wings. But, in spite of its almost exotic appearance, the present insect is no rarity in Central Europe. I have found it abundant (*e.g.*) in Thuringia, and it occurs, according to Thomson, in Scandinavia. Its special food-plant is said to be *Aegopodium podagraria*—a common and troublesome weed in many parts of England—so that *a priori* it seems rather to be expected than otherwise that it should occur and even be common in more British localities than the only one where it is as yet positively known to have occurred.

Brunswick, Woking.

May 14th, 1919.

The Dollman Collection.—In the obituary notice of Hereward C. Dollman issued in the present No. of this Magazine, it is stated that his Rhodesian and British collections of Insects had been presented by his father to the Natural History Museum at S. Kensington. The Rhodesian Lepidoptera and Coleoptera are particularly valuable, and it is the first time that such an extensive series of beetles has been obtained from that part of Africa. Dr. Neave, it is true, had previously made large collections of the more conspicuous Coleoptera in the same region, but the smaller forms are not to be found amongst his insects. All that can be said at present is, that the Longicornia, *Curculionidae*, *Staphylinidae*, *Tenebrionidae*, *Buprestidae*, Phytophaga, and *Circulionidae* are particularly well represented in the Dollman Collection, and there must be many new species amongst them, particularly in the *Staphylinidae*.* The Heterocera include numerous interesting forms—bred series of various *Saturniidae*, with beautifully drawn illustrations of the larvae, etc., at least one new Sphingid, and doubtless many of the 668 species recorded by Sir George Hampson as having been taken by Dr. Neave during his two journeys in “Northern Rhodesia and the adjacent Territories” (P. Z. S. 1910, i, pp. 388-510, pls. xxxvi-xli). The Lepidoptera, it may be observed, were all taken or bred by Dollman during his second stay in N.W. Rhodesia, when he was in a very bad state of health, as a result of the Tsetse-fly attacks, the Coleoptera having been captured during the years 1913-1915, on his first sojourn in the country. We are indebted to Mr. N. D. Riley, of the Entomological Department of the British Museum, for the following particulars as to the Rhopalocera:—

The Dollman Collection of Butterflies includes about 300 species, represented by 3500 specimens, all in perfect condition, some 60 per cent. being bred specimens, all from N.W. Rhodesia. It is chiefly valuable on account of their excellent condition and of the amount of data concerning their life-histories. A MS. volume accompanying the Collection gives full data of times of

* Several of these are described by Cameron in the “Entomologist’s Record” for May, 1919..

occurrence, food-plants, habitat, etc., and, used in conjunction with the extraordinarily good coloured figures of larvae made by Dollman himself in Rhodesia, contains a considerable amount of valuable information which it is hoped will be published shortly, circumstances permitting. The number of new species and forms amongst the Rhopalocera is not great, but a new sub-species of the rare *Papilio mackinonni* is of interest, the collection containing a long series of bred specimens of this insect. The Charaxes are very fine, and include the bred series of so-called *C. ethoecles manica* and *phoebe*, proving them to be two species (Proc. Ent. Soc. London, 1918, p. clxxvi). Of *P. dardanus* there is a series all the ♀♀ of which are of the form *hippocoon* Fabr. Amongst the Pierinae there is a fine bred series of the rare (in collections) *Belenois picta* Neave, and a long, also chiefly bred, series of *Colias electo* L. The Satyridae include an undescribed *Mycadesis*, specimens of which had been previously taken by Dr. Neave in the same district. In Nymphalinae the life-histories of the Charaxes have received a lot of attention, and the very rare *C. peculiaris*, of which the B.M. had only the type-specimen (in coll. Adams), is represented by 2 ♂♂ and 1 ♀. There are 3 ♂♂ and 1 ♀ also of *C. ameliae* Doumet, another rare species. *Pseudacraea poggei* Dewitz is represented by a magnificent series of bred specimens. There are eight species of *Crenis*, and of *Crenidomimas concordia* Hopff., of which the life-history was previously unknown, a fine bred series. The genus *Precis* is very well represented and contains some interesting and rare forms. In the Acraeinae, that *A. diogenes* Suffert is the ♀ of *A. guillemei* is proved by a short series, of which one pair were taken in copula. There are some interesting forms of *A. welwitschii*, a fine long series of *A. mima* Neave, and a fine bred series of a large form of *A. encedon* L. The entire absence of any species of Planema is worthy of mention. Of Lipteninae only eight species are represented, but they include the very rare *Alaena aurantiaca*, and a long series of *P. multiplagiata* B.-Baker and *M. marshalli* Trimen. There are some 75 species of Lycaeninae, including a number of new or undetermined forms, and the same remark applies to the 70 odd species of Hesperiidae.—E.D.S.

Oxytelus insecatus Gr. in ants' nests.—This rather scarce insect appears to be associated with ants. I took one at Gravesend in the runs of *Lasius niger*, under a stone on April 25th, 1909. At Rickmansworth on April 17th, 1915, in a large heap of stones which is occupied by both *L. niger* and *L. flavus*, I found two in the runs of *flavus* and one with *niger*. On May 3rd of this year none were found under these stones, although both species of ant were abundant, but I shook five specimens out of a handful of moss close beside the nests. This moss contained a large number of *L. niger*. It is possible that, on this occasion the beetles were waiting for the ants to get used to them before venturing into the nest. I have only come across *O. insecatus* on two other occasions: two specimens in a chalkpit at Chippenham, Cambs, and again on Burwell Fen, where I caught one on a reed by the side of the lode. I may add that none of my captures are in any way damaged.—G. W. NICHOLSON, Oxford and Cambridge Club, S.W.: May 6th, 1919.

Note on the occurrence of Lamprinus saginatus Gr. with ants.—One found under a stone in the nest of a *Myrmica* at Carno, Montgomeryshire, at an elevation of over 1500 feet, on October 13th, 1914. One on Chamberlaynestown

Bog, Co. Meath, on June 6th, and two together on Balrath Bog, in the same County, on June 10th, 1916, in both instances out of moss by the side of a *Myrmica* nest. One on the Devil's Dyke, Cambs, on April 15th, 1917, out of moss, together with many specimens of a *Myrmica*. I regret that I omitted to identify the species of the ant in each case.—G. W. NICHOLSON.

Hemiptera in Jersey.—During the last half of April I had some interesting collecting in the Channel Islands, and especially in Jersey. The weather was for the most part all that could be desired, but occasionally we were reminded by some extremely high and intensely cold winds that it was unsafe to consider the winter as over. The island had experienced, as we have done here, a prolonged winter, and excess of rain: nevertheless, Hemiptera were plentiful, especially upon the sand-hills. All my collecting was done on the coast, but the four sides of the island were visited. The following species fell to my lot, and must all, I think, be regarded as over-wintered specimens and not products of the year; it will be noticed that they are chiefly Pentatomidae, Coreidae, Lygaeidae, and Reduviidae. *Podops inuncta* (1) at St. Ouen's Bay, *Cydnus flavigornis* and *Geotomus punctulatus* in tufts of moss in sandy places, the latter quite common; *Sciocoris cursitans*, common in sandy places; *Aelia acuminata* (1), *Ceraeopterus lividus* (1), *Aphanus lynceus* (1), and *Dolycoris baccarum*, several, at the roots of a narrow-leaved *Plantago*; a few *Spathocera dalmanii* in sandy places on Gorey Common, amongst stunted vegetation; this species is sluggish and lies low, so that, being so nearly of the colour of the ground, it is not at all easy to see; *Verlusia quadrata*, common on Marram grass on the sand-hills, some specimens found in cop.; *Therapha hyoscyami* (1) on sand-hills at St. Ouen's Bay; *Stenocephalus agilis* (1) on *Euphorbia portlandica* at Portelet Bay; *Corizus parumpunctatus* on sand-hills in different parts; these were all of the highly coloured and more typical form, with fore parts red, abdomen beneath greenish, and connexivum quite unspotted, very different in appearance from those that inhabit the sand-hills of S. Wales, which are dull-coloured with spotted connexivum; *Metacanthus elegans* on sand-hills at St. Ouen's Bay; it is curious that this insect subsists through the winter, when the *Ononis* with which it is always associated in summer is dead; in the present instance only very small shoots of the plants were beginning to show above the sand, and the bugs were not on or near these; *Lygaeosoma reticulatum*, common at the roots of vegetation and not easy to see; *Nysius thymi* (1), *Cymus clariculus* (1), and *Ischnorhynchus geminatus* (1) at Portelet Bay; *Pionosomus varius*, common in all sandy places; *Stygnoecoris fuliginens*, a few; *Ischnocoris angustulus* and *Macroderma micropterum*, common in heathy places, the latter including one macropterous specimen; *Heterogaster urticae*, *Leiosus maritimus*, and *Emblethis verbasci*,* common at the roots of Marram grass; *Rhyparochromus dilatatus*, *Peritrechus nubilus*, *P. sylvestris*, and *Notochilus contractus*, in moss at Giffard's Bay; *Plinthicus brevipennis*, common in sandy places; *Rhyparochromus praetextatus* (2) at St. Ouen's Bay; *Aphanus quadratus*, very common in all sandy places; *Drymus sylvaticus*, one specimen only (!); *Scolopostethus thomsoni* (1), *S. decoratus*, common; *Pyrrhocoris apterus*, not seen nearly so commonly as usual, probably because of the

* This species, it may be observed, was found in abundance by myself on Tresco and Samson, in the Scilly Isls., in July 1897.—G. C. C.

cold winds; when the sun was hot and the wind abated, they began to issue from the crevices in which they had been hiding; *Coranus subapterus* and *Prostemma guttula*, one macropterous specimen of each at St. Ouen's Bay, the latter, a most beautiful insect, taking refuge under a dried patch of cow-dung (!); *Nabis lativentris*, *ferus*, and *rugosus*. Young larvae of an *Odontoscelis*, probably *O. fuliginosa*, were not uncommon in moss; the species of this genus apparently pass the winter as young larvae, as I have previously found *O. dorsalis* in the same way. It was, of course, too early for *Capsidae*, except the very few that hibernate; of these I got only two, *Megaloceraea erratica*, ♀ (the ochreous form), and *Charagochilus gyllenhalii*. There were also large numbers of very young red Capsid larvae amongst the Marram grass, but I have not yet been able to identify them. I had but a few days in Guernsey, and only one could be devoted to collecting; I selected for this L'Aneresse, a sandy stretch in the north of the island; but a very cold N.W. wind was blowing with something like the force of a hurricane, and entomologizing was almost impossible; hence I found only *Verlisia quadrata*, *Stenocephalus agilis*, *Heterogaster urticae*, *Ischnocoris angustulus*, *Plinthisus brevipennis*, and *Stygnoecoris fuligineus*. All the species are on the British list with the exception of the *Lygaeosoma*.—E. A. BUTLER, 14 Drylands Road, Hornsey, N. 8.

Note on Hoplocampa testudinea Klug.—In June 1917 I collected a few apples containing larvae of this species, and the larvae duly buried themselves and formed their cocoons. Nothing came of these in 1918, but on May 5th this year (1919) two imagines appeared. I find there are still two cocoons intact, and from their apparently different specific gravities, I believe one of these contains a living tenant, but the other is probably dead. Of the few small sawflies I have reared most gnaw away portions of the cocoon to make an opening for escape, but this species cuts off a lid as neatly as does a *Trichiosoma*, a *Cimber*, or a *Lophyrus*, from which it differs by having its cocoon subterranean. I don't know whether it is usual for *H. testudinea* to pass two years in its cocoon, but it is noteworthy that my specimens avoided coming out in 1918, in which year, it is hardly exaggerating to say, there were no apples. One of the remaining cocoons has since produced an Ichneumonid, which Mr. Morley tells me is *Perilissus luteolator* Grav., ♂, not a common species, whose various recorded hosts are all Tenthredinids.—T. A. CHAPMAN, Betula, Reigate: May 9th, 1919.

Trichiosoma tibiale and *Acampsia pseudospretella*.—Last spring I sleeved out a number of both sexes of *Trichiosoma tibiale* on hawthorn, and later collected the cocoons that resulted; during the last fortnight a number of males have emerged and not one female. Though not yet affording any proof, this result supports the view that male flies are the only result of want of fertilisation in this species, with the added conclusion that this sawfly will not pair in such captivity as a fairly roomy sleeve supplies. To-day I examined the jar with the cocoons, all had emerged except two—one contained a dead male imago, the other a dead larva and also a living larva of *A. pseudospretella*. I could not find any hole or flaw in the cocoon, by which it could have entered even when newly hatched, but can only suppose it must, somehow, have entered at that stage. I have been occasionally puzzled to understand how this destructive pest reaches its feeding-habitat, but I think this instance most strongly exemplifies the difficulties of excluding it.

A male and female *Cimbex sylvarum* have emerged from two cocoons remaining over from 1917 larvae, being thus two years in cocoon, not in pupa, as one would say of most Lepidoptera, since they pass the winter in the cocoons not as pupae but as larvae. A specimen of *Croesus latipes* has also emerged after being two years in cocoon.—T. A. CHAPMAN: *May* 16th, 1919.

Taeniorhynchus richiardii Fic.: a correction.—In the Ent. Mo. Mag. for April last (pp. 83-88), Mr. F. W. Edwards has given an account on the development of *Taeniorhynchus (Mousonia) richiardii* Fic. The development of this Culicid is already recorded by Dr. C. Wesenberg-Lund in his valuable paper, "Anatomical description of the larva of *Mousonia Richiardii* Ficalbi found in Danish freshwaters," Videnskabelige Meddelelser fra "Dansk Naturhistorisk Forening" i Kjøbenhavn, Bd. 69, pp. 277-328, 1918.—PEDER NIELSEN, Centralbiblioteket, Sllkeborg, Denmark: *April* 23rd, 1919.

Obituary.

Hereward Chene Dollman, F.E.S.—On January 3rd, 1919, Hereward Chene Dollman died of sleeping sickness at Hove House, Bedford Park, London, W., in his 30th year.

Born on March 10th, 1888, he commenced to collect British Lepidoptera at the age of five, and during the following ten years, in conjunction with his father and brother, a very complete collection was got together. While at St. Paul's School, where he was educated, his interests turned towards British Beetles, and at the age of sixteen he was elected a Fellow of the Entomological Society of London. In the Museum of St. Paul's School are to be seen many instances of his early work, all carried out in a style that has rarely been surpassed. On leaving school he proceeded as a Scholar and School Exhibitioner to St. John's College, Cambridge, where he continued his work on Coleoptera, and played tennis and lacrosse for his College. In 1912 he discovered and described a beetle new to Science—*Longitarsus plantago-maritimus*. Shortly afterwards, on January 3rd, 1913, he left England for Central Africa, as Entomologist to the Sleeping Sickness Survey of the British South Africa Company. He was first stationed at Mwenga and later at Kashitu, and in these districts the greater part of his African Coleoptera were obtained. His work in connection with the "Tsetse" fly resulted in the discovery of a parasite, a species of *Mutilla*, new to Science, described by Turner as *M. glossinae*, and figured by Dollman in the "Transactions of the Entomological Society of London" in 1915.

After nearly three years in Central Africa he returned to England on leave, and married on February 23rd, 1916, Norah, eldest daughter of Dr. and Mrs. Holloway of Bedford Park: she accompanied him back to Central Africa and died at Kasempa on July 5th, 1916, shortly after a long trek across N.W. Rhodesia. After his wife's death he moved north to Solwezi and gave his attention to breeding Lepidoptera and making very careful drawings of many of the larvae. Eighteen months before his return to England his constantly recurring illnesses left him in no doubt that the "Tsetse-Fly" had done

its worst. In the autumn of last year he travelled south to Cape Town, breaking his journey at various places to receive such treatment as could be given him. On arrival in London, knowing that he had but very little time left, he set to work to arrange his collection of African Lepidoptera—a task he was not allowed to finish, being taken ill the Sunday after Christmas, and dying in the early morning of January 3rd, 1919.

His collections, consisting of many thousands of specimens of British and African Coleoptera and African Lepidoptera, and his drawings of the African larvae, have been presented to the National Collection.—J. G. D.

Harold Swale, M.D., was born in the year 1853 at La Verie, near Dinant, Brittany. He was the second son of the late Rev. H. J. Swale of Ingfield Hall, Settle, whose keen love of nature he inherited. Entering the medical profession, he settled down at Tavistock, and practised there for fourteen years. It was here that the writer first knew him, and formed a friendship, which—though maintained largely by correspondence—lasted till the day of his death. He turned very early to entomology as his principal recreation, devoting himself chiefly to the Hymenoptera.

It was not, however, among British insects that his main collecting work was to be done, and in 1900 he went to New Zealand, where he spent three years between Auckland and Rotorua, making extensive collections both of Coleoptera and Hymenoptera. In 1903 he returned to England, but, after two years, decided to take up tropical medicine, and thereafter took up appointments successively in the Sudan, Central India, Portuguese East Africa, Southern Rhodesia, New Zealand again, and, finally, Samoa. In each of these localities (except India) he spent two to three years, and many were the letters he sent home, full of shrewd comment, not only on the insects, but on all the manifestations of tropical life he saw around him.

His station in the Sudan was at Nabardi, with an unpromising outlook on sand and barren rocks; yet, during the three years he passed here, he managed by diligent search to get together quite good collections of insects, many of them new to science. In this he was ably helped by Mrs. Swale, who, not only here, but throughout his travels, generally accompanied him on his entomological excursions. A few weeks before his death he was telling the writer of the curious bursts of rain, which falls in Nabardi at rare intervals. At such seasons grass and flowers appear for a few weeks, and then the ground resumes for a long period its usual desert appearance. A curious fact he noted was that the insect life began to appear not only before the grass and flowers, but even before the rain had fallen—another case apparently of “intelligent anticipation.”

In India he passed but a short time, but at Sena on the Lower Zambesi, and later at the Lonely Mine, Rhodesia, he added largely to his collections. It was at Buluwayo he made the acquaintance of Mr. Arnold, Curator of the Museum, who fired him with an enthusiasm for ants; this no doubt accounts for the ant-collections made not only in S. Africa, but later on in Samoa.

In 1915 he came home with a view to taking up war work, and, as New Zealand seemed to offer the best field, he returned there, only to accept shortly afterwards a post in Samoa. The paucity of insect life here disappointed him,

and, although he made a considerable collection of ants, his medical duties, which ultimately became very onerous, occupied most of his time. In the end the work proved too heavy, and he returned to England last year. His death occurred quite suddenly on May 3rd, while he was engaged on his medical duties.

Dr. Swale did not himself write on entomology, or describe any of the new species he captured. Some descriptions of these have already appeared, and others no doubt will follow. Still, it is as a collector in many out-of-the-way lands that he made his contribution to entomological knowledge. Many of his Coleoptera he gave during his lifetime either to the writer or to the British Museum, and Mrs. Swale is generously presenting to the Museum all the remainder of his collections.

Among those who knew him he will always be remembered as a most genial and kindly friend, ever ready to give help where he could, and delighting in nothing more than discussing his favourite pursuit with his friends, or telling them of all he had seen during his long residence in tropical countries.—
H. E. ANDREWES.

Societies.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
April 10th, 1919.—Mr. STANLEY EDWARDS, F.L.S., F.E.S., President, in
the Chair.

Mr. Ashdown exhibited a copy of Panzer's "Symbolae Entomologiae" (quarto, 1802), with some fine plates of the Lamellicornia (Coleopt.). Mr. Leeds, a curiously discoloured example of *Colias edusa* from Herne Bay. The remaining exhibits were specimens and series of *Acidalia marginipunctata* by Messrs. R. Adkin, Buckstone, Tonge, Ashdown, Mera, Bowman, and B. Adkin, in illustration of the paper on this species read by Mr. R. Adkin. In the ensuing discussion the consensus of opinion was that the species was a coast insect and found, as a rule, only very sparingly inland. Reports of the season were made by several members. Most species were late in appearance, although a few were quite up to their usual date. *Celastrina argiolus* had been seen, *Brephos parthenias* and *Gonepteryx rhamni* had been abundant locally. Vegetation was generally backward.

April 24th, 1919.—The President in the Chair.

Mr. Newman exhibited a living female *Xylomiges conspicillaris* from Worcester, and a *Cassida viridis* (Coleopt.) recently found on a thistle. Mr. Bennett, *Papilio demoleus* from S. Africa and *Catagramma* sp. Mr. Edwards, *Papilio cenea* (*merope*) from S. Africa and several forms of the female. Mr. Buckstone reported that at Horsley he had met with a number of females of *Tephrosia bistortata* with ovipositors extended in crevices of bark in almost dying condition on a morning after an unusually cold night. Remarks were made on the lateness of the season and the general scarcity of larvae this spring so far.—Hy. J. TURNER, Hon. Editor of *Proceedings*.

ENTOMOLOGICAL SOCIETY OF LONDON: *Wednesday, February 5th, 1919.*—In the absence of the President, the Secretary, at his request, announced that he had appointed Dr. C. J. Gahan, Dr. G. A. K. Marshall, and the Rev. F. D. Morice as Vice-Presidents for the ensuing season. The Rev. F. D. MORICE, M.A., F.Z.S., then took the Chair.

Dr. Reginald Heber Prowde Hick, Eaglescliffe, co. Durham, and Messrs. J. H. Jurriaanse, Schickade, 75, Rotterdam, and F. G. Whittle, 7 Marine Avenue, Southend-on-Sea, were elected Fellows of the Society.

The following paper was read:—"The synonymy and types of certain genera of Hymenoptera, especially of those discussed by the Rev. F. D. Morice and Mr. J. Hartley Durrant in connection with the long-forgotten 'Erlangen List' of Panzer and Jurine," by J. Chester Bradley, M.Sc., Ph.D., Assistant Professor of Systematic Entomology in Cornell University, Ithaca, New York; communicated by Prof. Gordon Hewitt, F.E.S.

Wednesday, March 5th, 1919.—Comm. J. J. WALKER, M.A., R.N., F.L.S., President, in the Chair.

Mr. H. H. Corbett, 3 Thorne Road, Doncaster, and Major W. J. Paton, I.M.S., Stoke St. Gregory, nr. Taunton, were elected Fellows of the Society.

The President announced the death of Mr. F. DuCane Godman, D.C.L., F.R.S., formerly President of the Society, and read an appreciation written by Lord Walsingham. A vote of condolence with Dame Alice Godman was unanimously passed, the Fellows present rising in their places.

Mr. O. E. Janson exhibited, on behalf of Mr. C. E. Stott, an aberration of *Brenthis selene*, taken near Denny Bog, New Forest, on June 28th, 1918, it having the black markings of the fore wings blurred and extended, and the hind wings entirely black with the exception of the marginal spots and a few scales in the central area. Dr. E. A. Cockayne, specimens of the bee *Bombus lapponicus*, and its mimic *Oedina gona tarandi*, a parasite of the Reindeer, from Yakanski on the Murman coast of Russian Lapland, near the entrance to the White Sea. Mr. J. H. Durrant, a specimen of *Pieris rapae* ab. *novangliae*, a very scarce American form with yellow coloration. Prof. Poulton read interesting notes on Natal butterflies, copied from letters written to him by Mr. C. N. Barker of the Durban Museum. He also read further notes on *Hesperiidae* of the genus *Sarangesa* resting in holes in the Nuba Mountains, Province of the Sudan, written January 26th, 1919, at Talodi, by Lt.-Col. R. S. Wilson; and also a note on the eccentric movements of the hind wings in *Cyaniris argiolus* L., received from Dr. R. C. L. Perkins. The Rev. F. D. Morice called attention to a paper by Mr. J. J. Ward, F.E.S., in the Christmas number of the "Strand Magazine," which appeared to explain the object of the so-called "palisades" (erect columns of piled-up froth-bubbles) with which the young larva of the sawfly *Lyaconematus compressicornis* F. (= *vallator* v. *Vollenh.*) surrounds itself while feeding on a leaf of poplar.

The following papers were read:—"Notes on the Ancestry of the Diptera, Hemiptera, and other Insects related to the Hymenoptera," by G. Chester Crampton, Ph.D., communicated by G. T. Bethune-Baker, F.L.S., F.E.S. "Notes on Bonelli's 'Tableau synoptique,'" by H. E. Andrewes, F.E.S. "On a Migration of Yellow Butterflies (*Catopsilia statira*) in Trinidad," by C. B. Williams, M.A., F.E.S.

Wednesday, March 19th, 1919.—The Rev. F. D. MORICE, M.A., F.Z.S., Vice-President, in the Chair.

Lieut. L. A. Box, 80 Northampton Road, Croydon; Prof. J. Chester Bradley, M.Sc., Assistant Professor of Systematic Entomology, Cornell University, Ithaca, New York; Messrs. E. J. Burnett, M.A., 9 London Road, Forest Hill, S.E. 23; Bernard Douglas Cumming, Royal Exchange Assurance, Royal Exchange, E.C. 3; Capt Tickner Edwardes, R.A.M.C., The Red Cottage, Burpham, Arundel, Sussex; Lt.-Col. William Henry Evans, D.S.O., R.E., c/o Messrs. Cox & Co., 16 Charing Cross, W.C. 2; Mme. Fournier, 90 Boulevard Malesherbes, Paris; Messrs. H. C. Hayward, M.A., Repton, Derby; N. Marumo, Zoological Institute, Agricultural College, Imperial University, Komaba, Tokyo, Japan; Louis Nell, Imperial Bureau of Entomology, British Museum (Natural History), S. Kensington, S.W. 7; William George Fraser Nelson, 6 Craven Hill, W. 2; John Peel, Whittlesey, Cambs; Capt. Leslie Rawdon Stansfield, R.G.A., c/o Army and Navy Club, Pall Mall, S.W. 1; Major Watkin Temple, East Mersea, Essex; and M. P. Wytsman, Quatre Bras, Tervueren, Brussels, were elected Fellows of the Society.

Mr. H. Rowland-Brown communicated an extract from a letter addressed to him by Mons. Ch. Oberthür in reference to the death of the late Dr. Godman. Mr. J. H. Durrant exhibited a ♀ of *Areniphas sabella* Hmsn. which he had bred (July 23rd, 1917) from a larva found feeding in dates (May 3rd), purchased in London. Dr. H. Eltringham, specimens of the pupa and imago of *Cryptophaga rubescens*, and read notes. The Rev. F. D. Morice, 2 ♂♂ and a ♀ of *Tenthredella flavicornis* F. (*Tenthredo flava*, auct., nec L.) taken with many other specimens of the same at Lichfield in 1917. The only other British specimens are those recorded by J. F. Stephens, said to be from Plymouth.

—GEO. WHEELER, *Hon. Secretary.*

ODONATA FROM MESOPOTAMIA.

BY KENNETH J. MORTON, F.E.S.

(PLATE V.)

The following account of Odonata from Mesopotamia (the lower part of the Euphrates and Tigris to the Persian Gulf being included in the term) is based primarily on a rather large collection of over 300 specimens sent home by Captain W. Edgar Evans, R.A.M.C., and handed to me for examination by his father, my friend Mr. William Evans. This collection has been supplemented by some material kindly sent to me by Captain P. A. Buxton, R.A.M.C., and by a smaller lot of specimens taken by Lieutenant P. J. Barraud, R.N., submitted by the favour of Mr. Herbert Campion.

The first mentioned collection was formed mainly round about Amara on the Tigris, where Captain Evans was stationed from the end of October 1917 to the beginning of November 1918. It was only in

the late autumn of 1918, rather too far on in the season for many dragon-flies, that he moved from this point, first to Ruz, at the foot of the Jebel Hamrin range of hills, north-east of Baghdad, and later proceeded to Kisil Robat, on his way to Kermanshah in Persia, at which place he was attacked by dysentery, which put an end to his work for the time being. Thus most of his insects came from the lower Tigris, and the specimens from Captain Buxton and Lieutenant Barraud are entirely from the lower sections of the great rivers. There is, however, enough to indicate the existence of a very interesting dragon-fly fauna containing representatives of the Mediterranean region mixed with Indian and Ethiopian elements. *Brachythemis fuscopalliata* appears to be a species of restricted range, as far as I know recorded from no other region than Mesopotamia and the Persian Gulf. The great abundance of *Selysiothemis nigra* is worthy of special mention, and a somewhat aberrant *Ischnura* appears to be new. It is also of much interest to find that several species recorded by Barteneff from Bokhara occur commonly on the Tigris (Revue Russe d'Entom., xiii, 1913, No. 1, pp. 176-189).

The dragon-flies of Mesopotamia are included in de Selys' "Odonates de l'Asie Mineure" (Annales Soc. Ent. Belgique, xxxi, pp. 1-49). In that paper 83 species in all are recorded, but mostly from the Mediterranean coasts and the more northern parts of Asia Minor, relatively few being mentioned as from Mesopotamia and most of these European species from Malatia, which is hardly to be considered as coming within the boundaries of Mesopotamia at all. Other isolated records may exist, but not much of importance, and it would perhaps be premature to attempt even a preliminary list until something has been done in the way of exploring the northern parts of the country and the hills and valleys to the east of the Tigris. It is almost certain that important additions to the list will eventually be found there, and may include interesting species that have been recorded from Asia Minor, the Caucasus, Northern Persia, Turkestan, and away farther east to Kashmir.

In the lower part of the region at least the climate seems to be almost tropical, and Captain Evans says that dragon-flies are found all the year round. He mentions, for example, seeing quite a number of *Crocothemis* in a sunny field at Kisil Robat in December (one of his specimens is dated the last day of the year), and in the other winter months the same species occurred (although in much reduced numbers compared with the summer) in warm sheltered places on sunny days. De Selys' original record of *B. fuscopalliata* is based on specimens from

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the lower Euphrates in January and February, and *Ischnura evansi* is already out in February and March, *Anax* and *Hemianax*, being also in evidence early in the latter month.

The dragon-fly fauna of lower Mesopotamia is probably not extensive, the drying up of the marshes in the great summer heat having no doubt the effect of restricting it to such species as can accommodate themselves to this condition or can use the large rivers and irrigation canals as alternative breeding waters. It is to the more elevated parts of the country that one must look for fresh additions to the lists.

In the notes that follow I have quoted freely observations made by Captain Evans on many of the species taken by him as recorded in his letters home. These seem worthy of preservation, and may serve to make the list more useful than if it were confined to a bare enumeration of the species taken. Having regard to the extent of his collections in other orders (to say nothing of plants) it might be thought that dragonflies received but a small share of attention. But the care and accuracy with which these and other things have been handled, and the magnitude of the collections as a whole, tend rather to convince me that no species of dragon-fly that was seen has escaped incorporation! It is of significance that so keen and experienced an entomologist as Captain Buxton, working in the same district, does not appear to have met with any additional species. Lieutenant Barraud found *Trithemis annulata* at Basra, a species which is absent from the other collections.

1.—*Sympycna paedisca annulata* Selys.

2 ♂♂, 2 ♀♀, November 6–18th, 1917; 6 ♂♂, 6 ♀♀, April 28th, May 5–6th and 12th (Amara); 1 ♂, 1 ♀, November 30th, 1918, Jebel Hamrin, N.E. of Baghdad (Evans); also 1 ♂, Amara, May 14th, 1918 (Buxton). Those of April 28th are the most immature. The examples show little variation in the bronze markings; some of them have a tooth-like marking projecting from the outer edge of the bronze median line on the thorax.

Evans wrote 20.iv.18: "These were not abundant and were usually observed singly resting on grass in similar situations to those described for *Crocothemis servilia*. None have been observed this year; all the specimens seen occurred last autumn." 5.v.18: "This dragon-fly was first seen this season on April 26th resting among long grass in a palm garden on the left (north) bank of the Tigris above Amara. To-day I got three specimens among grass by the side of the Masharra Canal. The specimens are found singly, and are not yet numerous.

The species rests with the wings folded together backwards parallel to the body. Both sexes about equally frequent."

Evans's observation of the position of the wings is interesting. In this respect it differs from *Lestes* and agrees with the closely allied European *S. fuscata*. The latter is remarkable on account of its habit of hibernating, pairing taking place in the early spring.

S. paedicea annulata was originally described from Malatia and Antioch. The example from Quetta referred to by me as *S. fuscata*, Trans. Ent. Soc. Lond. 1907, p. 308, is no doubt of the same form. Further information regarding the different Asiatic forms will be found in Barteneff's paper, "Contributions to the Knowledge of the Species of the Genus *Sympetrum*, etc." (Annuaire du Mus. Zool. de l'Academie Imp. des Sciences de St. Pétersbourg, t. xvii, 1912).

2.—*Ischnura evansi*, n. sp.

♂. Head above black; frons anteriorly with a broad yellowish band, with a yellow line or elongate spot on each side reaching to about the base of the antennae, and the eyes margined with the same colour to about the same level;

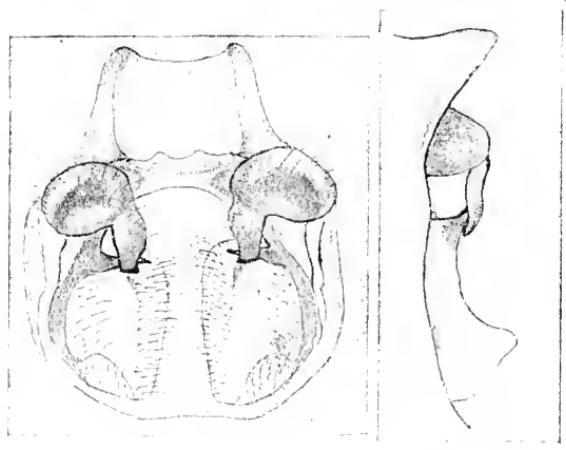


Fig. 1. *Ischnura evansi*. Dorsal view of appendages, from a preparation of the last abdominal segment, cleared and mounted in balsam.

2.—Profile view, but at an angle sufficient to show the perpendicular branch of superior appendage.

post-clypeus bronzed black, ante-clypeus and labrum yellowish, the latter with the proximal margin narrowly black, this black line rather sharply produced in the middle; post-ocular spots moderate, round. Prothorax black, anterior margin bluish, the sides yellowish with pale hairs; posterior margin also marked with yellowish and produced in the middle into a short, broad lobe with very slightly rounded almost truncate margin. Thorax black, anter-humeral lines often absent, when present very fine, greenish or bluish, and

sometimes interrupted; sides pale bluish or greenish with two short black lines on the sutures near the base of the wings. Legs bluish white, with black spines, femora and tibiae black externally, tarsi and claws also with dark annulations. Abdomen bronzed black above, yellowish or bluish at the sides and beneath, eighth segment entirely blue, sternites with a black line up to about the eighth segment. First segment with a quadrate mark occupying nearly the whole dorsal surface, with a fine blue line posteriorly; segment two with metallic sheen dorsally; 1-3 blue at sides and beneath; 4-6 dorsally narrowly yellow at the base except at the dorsal carina; 3-6 narrowly black on the sides at their distal end; 7-9 blue at sides and beneath. Hind margin of tenth segment elevated, when seen from above nearly semicircularly excised. The appendages viewed directly from the side little visible, the superior showing as a somewhat triangular process and the inferior as a pale tubercle; viewed directly from behind the superior are black, ovate, inwards with a large perpendicular truncate branch; inferior with a large black acute tooth or process turned inwards towards the centre. Wings hyaline, neuration black; pterostigma rhomboidal, bordered with rather thick black veins, centre black (less densely so in hind wings), leaving a narrow, pale margin all round; it covers rather less than one cell in both wings.

♀. Head and thorax much as in the ♂, but the prothorax has two small pale lateral dots; ante-humeral stripes on thorax broad and distinct; black on legs reduced, sometimes partly broken up into dots; dorsal spot on first segment of abdomen cleft by a pale line for a considerable part of its length (may be divided entirely). Pterostigma, as a rule, less dark in the centre than in the male. Examples occur having the thorax and first abdominal segment as in the male.

Easily separated from *Ischnura bukharensis*, occupying the same area, by the pterostigma of the fore wing of the ♂, which in *I. bukharensis* has the outer portion pale as in the more typical species of the genus. In *I. bukharensis* the prothoracic lobe is lower and the neuration of the wings at the apex shows a closer network in both sexes. No red females have apparently been found, a circumstance which might suggest association with *Enallagma*, but, on the whole, it seems preferable to regard the species as a somewhat aberrant *Ischnura*. In the material examined the 8th abdominal segment is constantly blue in both sexes.

Length of hind wing . . . ♂ 16-17; ♀ 15-20 mm.
,, abdomen . . . 23-25; 20-26 mm.

1 ♀ on bushes by side of Tigris, Amara, November 5th, 1917; a long series of both sexes from the Azizah Marshes, near Carraba Jedeid, between Masharra and Chahala Canals, about twenty miles from Amara, March 2nd, 1918; and further ♂ ♂ and ♀ ♀, chiefly from gardens by the Masharra and from near the Tigris, March 17th, 19th, 22nd, April 2nd, 21st, 28th, and May 2nd, 1918 (*Erans*); also ♂ ♂ and ♀ ♀ at Amara. March and April; ♀ ♀, Qurnah, May 17th; Hamar Lake,

R. Euphrates, 1 ♀, May 18th, 1918 (*Buxton*) ; 4 ♂ ♂, 1 ♀, Basrah, open marshes, February 11th, 1919 (*Barraud*).

Evans states, 20.iv.18 : "This dragon-fly was scarce last autumn, only an occasional specimen being seen, and then singly. I saw it at Basra as well as here. On March 2nd, 1918, I went on an expedition to the marshes near Carraba Jedeid, and saw very large numbers of the insect apparently newly hatched. They were mostly resting on the leaves and dead flowering stems of *Typha angustifolia*, which was there abundant. As many as six or more were seen on a single stem, and five were captured in a single lunge from the Ballum (native boat). Since then the species (?) has been abundant everywhere, especially along the margins of irrigation ditches and pools caused by the rise of the river. The colour variations have completely mystified me and I am quite prepared to learn that two insects are included under my collecting number." [Only examples of *I. evansi* are included in the collecting of March 2nd, but no doubt the later observations above refer to both this species and *I. bukharensis*. Subsequent examination of "undoubted pairs" appears to have confirmed his belief in the presence of two species and enabled him to separate his specimens practically without error.].

5.v.18 : "This species is still abundant." After May it was not definitely noted. A favourite habitat of both species was "on the lucerne and along the irrigation ditches watering it."

3.—*Ischnura bukharensis* Bartenev.

1 ♂, 5 ♀ ♀, March 17th; 1 ♂, 11 ♀ ♀, April 2nd–28th; 2 ♂ ♂, 3 ♀ ♀, May 4th, 5th, and 6th; 1 ♀, August 5th, 1918 (at light), all from the neighbourhood of Amara (*Evans*); ♂ ♂ and ♀ ♀, March and April, 1 ♂, June 13th, Amara; 1 ♀, Hamar Lake, May 18th, 1918 (*Buxton*); 3 ♂ ♂, 3 ♀ ♀, Basra, November, 1918 (*Barraud*).

Taken in garden by the Masharra; at irrigation ditches in the palm gardens, and by the Tigris above and below Amara. The disparity in the numbers of the two sexes taken by Evans is probably accidental, or it may be due to his having been attracted by the heterochromatic orange females of which the series largely consists; there appear to be no black or homoeochromatic females (*i.e.*, similar colouring to the males), and only a few olive-coloured heterochromatic ones.

I believe this species to be identical with *Ischnura fountainei* Morton, described from Algeria, and scarcely to be separated therefrom even as a good race. At first I was disposed to consider the centrally directed processes of the superior appendages as shorter in the present

material, but on further examination the difference in this respect appears to be unimportant.

[It may be mentioned here that *Ischnura musa* Barteneff is closely allied to *I. forcipata* Morton (Trans. Ent. Soc. Lond. 1907, p. 306) if it is not the same species.]

Evans reports, 27.v.18: "Only examples of this form have been seen lately" (*i.e.*, no *I. evansi*) ; "most of the females are much redder than before."

5.ix.18: Has almost gone now; only an occasional straggler of small size being found; any females seen are of the rufous-sided sort."

4.—*Lindenia tetraphylla* Lind.

At Amara this fine insect was first seen on May 6th (two only, one ♀ taken) along with *Auormogomphus* about barley-fields interspersed with succulent *Suaedas*, on a salty clay baked hard; not near the river. Specimens all dated May, from 6th to 22nd; ♀ ♀ 6th and 11th teneral with imperfectly developed hind wings. A ♂ dated 11th is fairly mature, and the majority of those taken afterwards up to 22nd, mature (*Evans*). Taken also by Buxton at Qurnah, R. Tigris, May 17th (♀ ♀); and at Hamar Lake, R. Euphrates, May 18th (♂ ♂, ♀ ♀), all fully mature specimens.

No exact indication of the duration of this species beyond Captain Evans's remark, 5.ix.1918: "I have seen none for some time."

5.—*Anormogomphus kiritshenkoi* Barteneff.

First taken at Amara along with *L. tetraphylla*, May 6th, 1918; the majority of the specimens taken up to the 14th of that month not quite mature. On September 5th Evans reports: "Still frequent, but not so abundant as it was about a month or so ago. It has been very common throughout the summer chiefly in dry places about gardens, but occurring almost everywhere." Also taken by Buxton at Amara, ♂ May 28th, ♀ June 10th; and at Qurnah, May 17th (♂ ♂).

There appears to be no doubt that this Gomphine from Mesopotamia is the same as the above-named species, described by Barteneff from Bokhara (Revue Russe d'Entom. xiii, 1913, No. 1, p. 179, figs. 1-4). It is closely allied to *A. heteropterus* Selys, from India. The neuration, however, seems closer when compared with Williamson's figure of the wings of *A. heteropterus* (Proc. U.S. National Museum, vol. xxxiii, p. 299), and the character in the Key (p. 275) "one row of cells

between M₁ and M_{1a} in fore wing to wing margin," does not hold good for *A. kiritshenkoi*.

6.—*Aeschna mixta* Latr.

1 ♀, taken at artificial hollows by Ruz Canal, north-east of Baghdad, 7.xii.18 (*Evans*).

An old specimen with colours in good preservation, not differing from European examples. Others were seen but not taken.

7.—*Anax parthenope* Selys.

2 ♀ ♀, palm garden near Masharra, March 20th; 2 ♂ ♂, Pindi Point, March 30th; 1 ♂, 1 ♀, by the Tigris five miles down stream from Amara, April 16th; 1 ♀, scrubby ground near fields by Tigris near Abusidra fifteen miles below Amara, April 11th; 1 ♂, 2 ♀ ♀, grassy ditches by side of Tigris five miles below Amara, May 6th; 1 ♀, large marsh by Tigris below Amara, May 22nd; garden by Mashara, September 10th, 1918 (*Evans*). Taken also about Amara by Buxton in March; 1 ♀, Basra, August 12th (*Buxton*).

The spring specimens are apparently all fresh, and although of varying degrees of maturity all seem to have reached full colour, the least mature being those taken by Buxton in March (without more exact date), and a ♂ taken by Evans March 30th and a ♀ April 11th. A female, May 22nd, begins to show darkening of the wings, while Buxton's Basrah example has the wings, except the apex, clouded with brown, a mark of age.

5.ix.1918, Evans wrote: "None of this has been seen for a considerable time." 10.ix.1918: "The autumn hatch is evidently beginning as I got to-day a fine fresh *Anax* and found a lot of *Sympetrum fonscolombii*."

8.—*Hemianax ephippiger* Burm.

1 ♀, palm garden near Masharra, March 20th; 2 ♂ ♂, palm garden by Tigris above Amara, March 22nd; 2 ♀ ♀, palm garden on Masharra, March 25th; 1 ♀, scrubby ground near fields by Tigris near Abusidra fifteen miles below Amara, April 11th; 5 ♂ ♂, 4 ♀ ♀ among *Scirpus*, large marsh twelve miles below Amara, May 26th–29th and June 5th, 1918 (*Evans*); 1 ♀, Amara, July 2nd, 1918 (*Buxton*).

Examples taken up to and including April 11th are all mature; those in May and June teneral, the thorax and under parts up to middle of 3rd abdominal segment bluish white; abdomen otherwise pale reddish

brown, the dorsum of 2nd segment (which in the mature ♂ is a beautiful blue) slightly darker; the hind wings in the middle suffused with yellow.

This species and *Anax parthenope* first appeared at Amara early in March. Although Evans noticed differences in his specimens, his earlier observations are applicable to both species. 20.iv.1918 he wrote: "A few single specimens were observed about the palm plantations last autumn, but none could be taken as they are strong rapid fliers and I had no net. This spring one or two isolated examples were seen about the beginning of March; then suddenly about the middle of the month they appeared in large numbers "and may now be seen almost anywhere even in the streets of the town. They are numerous in the gardens and fields, and even in scrubby and comparatively open desert land. They are fond of resting among dead camel thorn (*Acacia*), which covers large areas beyond cultivation, or even on the bare ground in open places." 5.v.1918: "Few specimens—in fact very few—are now to be seen." 5.ix.1918: "There are none of these dragon-flies now at the big marsh which has completely dried up. Nor have I seen any anywhere else for a considerable time." 6.xi.1918: "By the way there was a large hatch out of the *Hemianax* last week (October 27th and November 2nd). Possibly they breed in the river itself as they were seen close to it."

The mature spring examples may have been the same as the previous autumnal appearing ones, but having regard to its propensities for migration, the occurrence of mature *Hemianax* anywhere within the breeding range of the species is no proof of local origin.

(To be continued.)

STUDIES IN RHYNCHOPHORA.*

BY D. SHARP, M.B., F.R.S.

4. AN ABERRANT NEW GENUS AND TRIBE FROM NEW GUINEA.

ANGIANIDES, trib. nov.

Oculi convexi; thorax antice profunde constrictus. Abdomen segmentis subaequalibus suturis profundis. Prope Hylobiides collocanda.

The New Guinea insects, for which I propose this tribe, run down to *Hylobiides* near *Chrysolopus* and *Aclees*, to which, however, they have very little resemblance. The male is amongst the most remarkable of the *Curculionidae*, being with the rostrum more than two inches long,

* Continued from Vol. LIV, pp. 1-7, Jan. 1918.

the rostrum itself being nearly one inch long, stout, slightly curved, and hirsute beneath. It has, too, very long legs. The supposed female is a much less remarkable creature.

ANGIANUS, gen. nov.

Serobis linearis, *rectus*, *elongatus*, *haud profundus*. *Antennae sat elongatae*, *scapo subrecto*, *funiculo 7-articulato*, *clava gracili*, *acuminata*, *triarticulata*, *suturis discretis*. *Unguiculi elongati*, *liberi*.

Angianus pratti, sp. n.

♂. *Niger*, *thorace inaequali*, *rugoso*, *elytris acute costatis*, *inter costas regulariter transversim rugosis*. *Pedibus elongatis*, *femoribus tuberculo minuto*, *anteriorum coixibus spina elongata*. *Long. corporis cum capite 40 mm.*, *rostri 19 mm.*

Rostrum moderately thick, regularly but not greatly curved, dull, densely rugose, flattened at the sides, underneath densely tuberculate and hirsute; scrobes straight, rather deep in front, but shallow behind, and becoming indefinite just before reaching the eye. Front of gular peduncle deflexed and prominent. Antennae inserted very near the apex of the rostrum, strongly elbowed, scape about 11 mm. long, not reaching the eye, funicle (including the 7th joint) 7 mm.: the 7th joint is elongate and really forms part of the club, but its pubescence, which is whitish, distinguishes it therefrom, the true club is quite narrow, and is acuminate; the 2nd joint of the funicle is long, much longer than the 1st or the 3rd. Eyes separated from thorax by a distinct space, making their convexity conspicuous, very widely separated beneath, moderately distant above. Prothorax 10 mm. long, 10 broad, strongly constricted in front, with large shallow depressed spaces along the middle, at the sides very coarsely rugose; no ocular lobes and only a slight emargination of the middle beneath. Scutellum rather large, its tip peculiarly raised. Elytra about 25 mm. long, and 13 broad at the prominent shoulders; each with four costae, besides the suture, which is also raised in a costiform manner; the sculpture between these costae is of a very peculiar nature, and may be described as consisting of two series of punctures, each puncture being greatly expanded, so that the intervals are reduced to transverse ridges, the points of which reach those of the second series; a few very small pallid scales can be detected on careful examination.

Front coxae each bearing a long, slightly curved spine, and each femur a small pointed tubercle. Hind femur $12\frac{1}{2}$ mm. long, the tibia slightly shorter. All tibiae with a sharp mucro.

There are a few scattered pallid scales on the under surface; the mesosternum slopes gently in front. The tarsi are rather long, spongy beneath, 3rd joint bilobed, claw-joint long.

The abdomen is 14 mm. long, 1st segment nearly 5 along the middle, 2nd 3, 3rd 2, 4th $1\frac{3}{4}$, 5th $2\frac{1}{4}$. Dorsal plates black, but not hard.

The wings are ample.

Hab. NEW GUINEA, Angi Lakes (*Antwerp E. Pratt*).

A single example of this remarkable insect was found by my old friend, the distinguished traveller A. E. Pratt, near the Angi lakes, at an elevation of 6000 or 7000 feet in Northern New Guinea.

The male genital characters, so far as I have examined them, show no peculiarities that may account for the extraordinary secondary characters, and in fact support the conclusion that there may be a real affinity with *Hylobiidae*. The last ventral is divided, the two halves large and strongly chitinised. The speculum moderate, the rod strongly curved, without dilatation at the free extremity, the fork moderate, a little asymmetrical. Tegmen a complete ring, no strut, but a very short prolongation; superior appendages remarkably large, but only imperfectly chitinised. Median lobe in the form of a trough, strongly chitinised, with membranous dorsum, and with a large membranous, diverticular fold basally; tip obtusely pointed, deflexed in a gentle curve; struts about as long as the body, slender, curved, joining the underside of the body, which projects between them as a large angular piece. The sac not examined, apparently quite internal. Median orifice showing no special structures.

In addition to Mr. Pratt's example, I have another from a neighbouring region—the Arfak Mountains—which may possibly be the female of *A. pratti*, though it may be an allied genus. It is much smaller, and the rostrum is ordinary, being about 9 mm. long, with few hairs beneath, and the antennae not so near to the tip; the prosternum is broadly, but not deeply, emarginate in front; there are no spines on the front coxae, and the femoral tubercles are minute. On the elytra there are little irregular patches of a few distant pallid scales.

Although it is rare in *Curculionidae* for the ♂ to be much larger than the female, yet there are numerous cases in *Calandridae* and *Cholidae* where this occurs to a remarkable extent. As no such phenomenon is yet known amongst the forms related to *Hylobius*, we must wait for further information before attempting to decide the question as to the relation of this Arfak specimen to the male of *A. pratti*. The character of the gular peduncle is unique amongst *Curculionidae*; as it is not found in the Arfak specimen, which in many other respects is so closely allied, this increases the difficulty of deciding on the relations of the two forms.

Brockenhurst.

June 9th, 1919.

ON SOME NEW SPECIES OF THE STAPHYLINID-GENUS
PLANEUSTOMUS Duv. FROM INDIA,
 WITH NOTES ON CERTAIN ALLIED FORMS.

BY GEORGE C. CHAMPION, F.Z.S.

About three years ago my second son, Capt. F. W. Champion, while he was living at Sarda, near the banks of the Ganges, about 100 miles above Calcutta, sent me a large number of small Coleoptera from that locality, most of which he had taken either "at light" or on the wing in the evening. Amongst these beetles there were at least three (possibly five) species of *Planeustomus*, all closely related to rare Palaearetie forms, the genus having hitherto contained but one eastern representative, *P. indicus* Fauv., from Burma. The genera of this section of Oxytelini have always interested me, as it has been my good fortune to capture *Acrognathus*, in abundance, *Deleaster*, and two species of *Planeustomus*, in Surrey, all on the wing towards sunset; and *Oncophorus pirazzolii* Epp., in numbers, in Southern Tunisia*, "at light."

The following corrections in the synonymy of two known members of this group require notice†: the generic name *Oncophorus* Eppelsheim (1885) is preoccupied in Insecta (1874), and the name *Oncogenys* is here substituted; *Compsochilus africanus* Fairm. (1860)—a large shining black form with red elytra not unlike the common *Coprophilus striatulus* F. in general facies,—specimens of which, from Algeria, have been sent me by M. Théry, has 5-jointed tarsi, and it should therefore be transferred to *Acrognathus*, the tarsi having three visible joints only in *Planeustomus*. The latter name is stated by Jaquelin-Duval to have priority over *Compsochilus* Kraatz.

Descriptions of the three new species from Bengal are given below.

1.—*Planeustomus longiceps*, n. sp.

Very elongate, narrow, linear; shining, rufo-testaceous or testaceous, the legs and elytra somewhat flavescent, the apices of the latter and of the abdomen sometimes slightly infuscate, the eyes black; clothed with fine, scattered, bristly, pallid hairs. Head rather long and convex, wider than the prothorax, impressed with moderately coarse, scattered punctures, which are mostly placed on the basal half and around the eyes, showing a tendency to form two short anteriorly converging series in the middle behind; eyes small, depressed, about equalling the post-ocular space in length, as seen from above; antennae with joints 3–6 small, 4–6 transverse, 7–11 much stouter and wider, 7, 9, and 10 moderately, and 8 strongly, transverse, 8 shorter than 7, 11 oval. Prothorax

* Cf. Ent. Mo. Mag. I, p. 77 (1914).

† They are not given in Bernhauer's and Schubert's Catalogue (1911).

longer than broad, trapezoidal, widest in front and obliquely narrowed thence to the base; with two sinuous, anteriorly diverging, somewhat widely separated, uniseriate-punctate shallow grooves on the disc—the two connected by a transverse punctured groove near the anterior margin,—and numerous irregularly distributed punctures along the sides. Elytra longer than the prothorax, about as wide as the head; shallowly, irregularly punctate-striate, the striae not reaching the apex, where the puncturing becomes more confused, the second stria from the suture sometimes obsolete and represented by a row of scattered punctures. Abdomen extremely finely shagreened and with a few minute punctures.

Length $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

Hab. INDIA, Sarda in Bengal (*F. W. C.*).

Fifteen examples, varying a little in the development and puncturing of the head, as well as in size, one specimen being much longer than the rest. Smaller and much narrower than *P. miles*, Scriba, examples of which, captured by M. Théry at Tarfaia, Algeria, are before me; the head and prothorax rufo-testaceous or testaceous, the head longer, the eyes much smaller; the antennal joints 7–10 more transverse, and very short. *P. indicus* Fauv., from Burma (Rev. d'Ent. xxiii, p. 91, 1904), is said to have the head more rounded than in *P. miles*, and it cannot therefore be conspecific with *P. longiceps*.

2.—*Planeustomus bengalensis*, n. sp.

Elongate, robust; shining, testaceous, the antennae (except at the base), the apices of the elytra, and the sides of the abdomen slightly infuscate, the eyes black; sparsely flavo-pubescent. Head transverse, rather broad, very coarsely, irregularly punctate, the post-ocular space short, not half the length of the eyes as seen from above, the latter moderately large and rather convex; antennae with joints 4–6 small, transverse, 7–11 much stouter and wider, 7, 9, and 10 moderately, and 8 strongly, transverse, 8 smaller and shorter than 7 or 9, 11 oval. Prothorax trapezoidal, narrower than the head, as long as broad, the sides obliquely converging from apex to base; with two sinuous, anteriorly diverging, closely uniseriate-punctate, somewhat widely separated sulci on the disc—the sulci connected by a punctured transverse groove near the anterior margin—and numerous coarse, irregularly distributed punctures along the sides. Elytra larger and much wider than the prothorax; closely, irregularly punctate-striate, the striae becoming obsolete and the puncturing confused towards the apex. Abdomen extremely finely shagreened and with a few scattered minute piligerous punctures.

Length $3\frac{2}{3}$ mm.

Hab. INDIA, Sarda in Bengal (*F. W. C.*).

One specimen, with the abdomen somewhat “run up.” Smaller than *P. heydeni* Epp., a specimen of which from Anatolia is before me; the head equally coarsely punctured; the antennae much shorter, the joints

4-6 small and transverse, and those following more transverse; the eyes smaller; the prothorax obliquely narrowed from apex to base; the elytra less elongate. Another example from the same locality, possibly a ♀ of the same species, is narrower and much less robust, and has the head less coarsely punctured, and the puncturing of the prothorax more confused (possibly abnormally so), the grooves on the disc being shallow and interrupted. *P. indicus* Fauv., according to the description, has the sixth antennal joint more strongly transverse than the fifth, and the head more rounded, and the prothorax very little shorter than in *P. miles*, a definition not applying to *P. bengalensis*.

3.—*Planenstomus subcarinatus*, n. sp.

Elongate, very narrow, linear; moderately shining, testaceous, the eyes and the sides of the abdomen at the apex black, sparsely pubescent. Head (excluding the labrum and mandibles) transverse, alutaceous, rather coarsely punctate; eyes convex, small, nearly reaching the basal constriction of the head; antennae with joints 4-6 transverse, small, 7-11 much stouter and wider than those preceding, 7 and 8 strongly, and 9 and 10 moderately, transverse, 8 slightly shorter than 7, 9 and 10 broader than 7 and 8, 11 short oval. Prothorax a little longer than broad, narrower than the head, trapezoidal, obliquely narrowing from apex to base; alutaceous, with two narrowly separated, shallow, uniserrate-punctate grooves on the disc—the space between the grooves appearing smoother and cariniform posteriorly,—and numerous fine punctures along the sides. Elytra longer than broad; closely, finely punctate-striate to apex. Abdomen extremely finely shagreened and with minute piligerous punctures.

Length 2½ mm.

Hab. INDIA, Sarda in Bengal (*F. W. C.*).

One example; a second, somewhat discoloured and “run up,” specimen from Sunderbans, appears to belong to the same species. A small, narrow form, nearly related to the European *P. palpalis* Er., differing from it in the more convex eyes, the more thickened outer joints of the antennae, and the shining head and prothorax.

Horsell.

May 12th, 1919.

Melanophila acuminata de G. at a fire in June.—On June 15th, during four hours' diligent searching, I saw about two dozen specimens of *Melanophila acuminata* de G., near Wellington College, at a big forest fire which had been burning for more than a week. They flew about in the smoke and settled on the burnt wood and hot ashes in the manner so well described by the late Mr. W. E. Sharp (Ent. Mo. Mag. liv, p. 244, 1918). The time of year no doubt accounts for their scarcity. Of the eight I managed to capture, the

argest forcibly drew my attention to himself by giving my neck a rather painful bite. This habit is, I believe, common to several members of the genus. The attraction of fire and smoke for *Melanophila*, though strange at first sight, is natural and comparable to that of their respective food-plants for other species. Our insect is the only Buprestid of its size that has been able to establish itself in this country. It must therefore possess some advantage not shared by others of the group. This advantage is to be found in the fact that it spends its existence in wood which has recently been subjected to an amount of heat sufficient to kill all competitors. What more natural than that the smell of the larval food whilst cooking should have an irresistible attraction for the adults? It is their place of meeting and of courting, as well as the nursery of future generations. Mr. Sharp's suggestion (which he himself does not seem to have credited) that the females may lay their eggs in wood which is on the point of being consumed by fire, I cannot believe. The few I saw gave me the impression that they knew full well what they were about, and I noted two or three dull-coloured specimens (and therefore presumably females) carefully inspecting the charred stumps well behind the active part of the fire. The exhilaration and delirium of the one great moment of their lives may well give rise to such aberrations of habit as that of attacking a human being.—
G. W. NICHOLSON, Oxford and Cambridge Club, S.W.: June 16th, 1919.

Some Coleoptera taken in Hertfordshire in 1918.—During 1918 I had occasional opportunities of collecting in Hertfordshire, mainly in the neighbourhood of Harpenden, and it was thought that a short note on some of the beetles taken might be of interest. In the following list, except where otherwise stated, the insects were taken within a few miles of Harpenden. Among the Geodephaga, the only interesting species found was *Cychrus rostratus* L. under dead leaves, etc., at the root of a tree-stump in a small wood; its power of stridulating was very marked. *Agabus sturnii* Schönh. and *Rhantus pulverosus* Steph. were taken among many other common *Dytiscidae*. The *Staphylinidae*, unfortunately, had to be almost ignored, owing to lack of time, but a single specimen of *Leistotrophus nebulosus* F. and a small colony of *Prognatha quadricornis* Lac. under bark were met with. Several interesting Clavicornes were found—*Necrophorus ruspator* Er. and *N. respillo* L., *Agathidium varians* Beck., *Anisotoma nigrita* Schmidt, *Pria dulcanarae* Scop., *Cryptarcha imperialis* F. (evening sweeping under trees), *Seydinaeus collaris* Müll. and *Cytinus varius* F. in moss at Brickett Wood, *Chilocorus similis* Rossi, also at Brickett Wood, on various species of *Salix* in September (numbers of the very peculiar spiny larval skin, within which the pupa remains, were also found on the leaves), *Rhizophagus bipustulatus* F., *R. ferrugineus* Payk., *Luemophloeus ferrugineus* Steph., *Silvanus unidentatus* F. (all four species under bark on the same log), and *Ips quadripunctatus* Herbst at Brickett under chips of wood. The Serricorns included *Athous longicollis* Ol. (several ♂♂ and one ♀), *Priobium castaneum* F., and *Dryophilus pusillus* Gyll.; whilst among the Longicorns *Grammoptera ruficornis* F. and *Strangalia armata* Herbst were common, the latter only for a very short season. One specimen of *Toxotus meridianus* Panz. was seen, and my sister found a *Leiopus nebulosus* L. indoors, probably brought in with some flowers from the garden. At Brickett Wood, *Lochmaea capreae* L. was common on *Salix*, and *Zeugophora subspinosa* F. turned

up on the young aspens; *Crepidoderella helvines* L. and *C. aurata* Marsh. were also very abundant there, and one specimen of *C. nitidula* L. was taken. *Cassida viridis* F. was extraordinarily abundant, locally, wherever there were thistles, and *Pyrochroa serraticornis* Scop. was seen frequently. *Byctiscus populi* L. was not uncommon on aspens at Brickett Wood; I also found one *Gymnetron antirrhini* Payk.; whilst among many common species of Ceuthorrhynchina, *C. melanostictus* Marsh. was taken on *Mentha*, also *Poophagus sisymbrii* F. and one *P. nasturtii* Germ., the identification of the latter having been kindly confirmed for me by Mr. O. E. Janson. The *Poophagi* were taken in September in a backwater of the small river Ver, a spot which would almost certainly repay further search for aquatic weevils. Among the *Scolytinae*, *Scolytus destructor* Ol. and *Hylesinus fraxini* Panz. were abundant, the only other species met with being *Dryocoetes villosus* F.—C. T. GIMINGHAM, Long Ashton, nr. Bristol: June 15th, 1919.

Platyrrhinus latirostris F. at Long Ashton, Somerset.—This interesting beetle has recently turned up in a rather derelict wood, not three miles from Bristol. A single specimen was met with on June 1st, on the bark of a dead tree, where, in spite of the size of the insect, its mottled appearance, harmonising almost perfectly with the background, made it very difficult to see. Further search on June 3rd led to the discovery of two more examples, a male and female, in the black fungus (*Daldinia concentrica*) on a decaying ash-tree—its usual habitat. The black fungus also yielded *Diphyllus lundus* F. in plenty, and several species of *Mycetophagus*. *Thanatus formicarius* L. was found in some numbers running on the trunks of trees or in crevices of the bark. Most of the localities given by Fowler (Coleopt. Brit. Isl. vol. v, p. 112) for *Platyrrhinus* are in the western counties: it is also recorded in the Victoria County History of Somerset as having been taken at Batheaston, and Porlock is given as another locality in the Supplement to Fowler's work.—C. T. GIMINGHAM: June 10th, 1919.

[On the two occasions on which I have come across *Platyrrhinus* in numbers on the Continent—at Vizzavona (Corsica) and Moncayo (Spain)—it was in fungus on dead beeches. Its habit of shamming death makes it difficult to detect amongst debris, the uniformly greyish pubescence of the under surface giving the insect a very different appearance when seen from beneath. This beetle is also recorded as having been found in fungus on alder and birch, so that it seems rather strange that in Britain it apparently prefers ash.—G. C. C.]

Note on a dark form of Liopus nebulosus Linnaeus.—My friend Mr. H. Campion has just shown me a large blackish form of this common Longicorn that he had found on his coat while resting under some beech trees in Kew Gardens on June 14th. Some years ago Mr. B. G. Rye gave me a similar example, one of several captured by him in the New Forest. In these insects the grey mottling of the elytra is reduced to a very narrow line along the suture and lateral margin and a patch on the outer part of the disc at about the middle, and the basal joint of the antennae is almost wholly black. Pie has named two pale varieties of the same species, but I cannot find any record of Mr. Rye's insect.—G. C. CHAMPION, Horsell: June 18th, 1919.

New localities for Hydrovatus clypealis Sharp.—I took several examples of this rare beetle last June (1918) in the Little Sea at Studland. Recently, Mr. H. R. Dakfield showed me a specimen taken on April 27th, 1918, in one of the ditches by the side of the road through Oxwich Marsh, Glamorgan. As an amplification of the record, "New Forest (Sharp)," in Fowler's Brit. Col. vol. vi. 211, I might mention that Mr. Gorham and I, a good many years ago, took this Dytiseid in abundance in a pond adjoining the railway close to Lyndhurst Road Station.—J. R. le B. TOMLIN, Reading: May 1919.

Colpodes splendens Morawitz, a Japanese Carabid in Berkshire.—Mr. Cosmo Melvill has recently handed me a specimen of *Colpodes splendens* Morawitz which was taken by his sister, Miss Evelyn Melvill, crawling on the ground at Hurst, Berks, in 1877. The genus to which this handsome Carabid belongs comes between *Olisthopus* and *Patrebus* of our lists, and the species is a native of Japan. It is impossible to conjecture how it found its way into Berkshire.—J. R. le B. TOMLIN.

Ocypterus cyaneus Payk. in Suffolk.—This is one of the comparatively few British beetles that appears to be really rare: not merely overlooked, locally common, or only rarely taken because their *modus vivendi* is unknown. In the course of just thirty years' collecting in Suffolk, I have never seen the species till May 29th, 1919; then, as I was brushing through a gap in the hedge, I saw *O. cyaneus*—even at the distance of some ten feet the blue coloration was unmistakable in the sunshine—run swiftly across a plain of clear sand, thrown out in front of a rabbit-hole. Before I could reach the spot, it had gained the shelter of the surrounding herbage; but I got my net hard down beyond its position and a little searching brought it to the tube in safety. This was at 2.30 p.m. (scientific time) just outside a belt of Scots pines at Butley, near Orford, a couple of miles from the Suffolk coast and in the hamlet of Capel Green. To the best of my knowledge four specimens have now been found in the county: Stephens's unlocalized record, on the high road at Risby; in Shakers Lane, to the east of Bury St. Edmunds (Ent. Rec. viii, p. 312) in 1896; and next the Butley specimen, which is now dry and measures 18 mm. in length. Some six specimens have been found in Norfolk: in gravel pits on Mousehold Heath, at Lakeham in 1883, Drayton (Norf. Nat. Soc. Trans. 1893), Cromer and Yarmouth (*i.e.* 1899). Fowler considered it "very rare" in Britain; and these two counties seem to be its headquarters. Elsewhere I find records only from Yorkshire by Stephens; Sherwood and "several" at Newark in Notts by Carr; Colchester; Coombe Wood by Stephens. All the British *Ocypus* are known to occur in East Anglia; *O. pedator* is at present confined to Norfolk, *O. similis* and *O. fuscatus* to Suffolk; the last has not there been found since Stephens's time, but that it still occurs is proved by its capture at Wicken, two miles over the western border in Cambs, as recorded in my 1915 "Coleoptera of Suffolk: First Supplement," p. 12.—CLAUDE MORLEY, Monks' Soham House, Suffolk: June 12th, 1919.

[*O. cyaneus* has been taken on several occasions in recent years at Tubney, Berks, by my friend, Mr. J. Collins (*cf.* Ent. Mo. Mag. vol. lii, p. 205), and I found a very fine ♂, only just dead, in this locality on August 3rd, 1918.
—J. J. W.]

Habits of Paucalia leuwenhorkella.—In a former note in this Magazine (vol. li, p. 241) I indicated the desirability of ascertaining whether this species rested with the hind legs lifted from the surface, as is the manner of the *Heliodinidae*. I have hitherto forgotten it each year at the right season, but this year I remembered and got my youngest son to collect some living examples, which I kept for two days and watched under various circumstances. The hind legs were never erected; in walking they are slightly bowed outwards, and, as it were, displayed, and when movement ceases they still retain this attitude, resting on the surface in the normal way; but when the insect is in repose (or asleep), the hind legs are removed from the surface and lie along the side of the abdomen. I verified this in several individuals, and consider that it confirms the location in the *Heliodinidae*; the same attitude is taken by *Vanicela*, for example. The antennae in repose are directed obliquely upwards and backwards.—EDWARD MEYRICK, Thornhanger, Marlborough: June 6th, 1919.

Note on a peculiarity in the burrows of Halictus maculatus Sm.—*Halictus maculatus* Sm., though first described from this country, has been very infrequently met with. I have only once come across it myself, and should certainly have been unaware of its presence had I not stopped to examine some burrows, which appeared to me in some way different from any others I had seen. These burrows were scattered over three or four square yards of a very large pasture-field, and not placed close together so as to form a compact colony. The surface of the field was almost level about the place where the colony was situated, and though there were some very attractive banks near by, these were not occupied by the species in question, nor could any trace of it be found in any part of the field save the one spot, where the burrows were first noticed. The opening of the burrows was very small, smaller in fact than that of the burrow of the common *H. tumulorum*, which was nesting in the same place, and was always exposed, none being covered over with the little heaps of earth that one usually observes over the openings of burrows when these are made in a practically flat surface. In many cases the earth removed from the burrows was very noticeable, but it lay around the opening and not above it. When I started to dig out the first burrow with a knife, I was surprised to see that directly below the opening the diameter became very much larger, and I felt sure that the bee itself would be something I was unacquainted with. Unfortunately, in this first attempt, the occupant was killed and dropped down the burrow, from which it could not be recovered. On examining the other burrows more carefully I saw that in each case the bee itself was stationed at the mouth, the head exactly filling the opening. If the bee withdrew for a short way down the burrow, a slight disturbance with a grass-stem at the opening would at once bring it back. In the case of those with which I interfered they did not ever retire to the depths of the burrow, as most bees do under such circumstances, and consequently they were easily unearthed. After obtaining about half a dozen specimens, I decided not to disturb this small colony any further, since on these hibernated females depends the fresh produce of both sexes in the later summer. It seems a remarkable fact that on a warm summer morning in June, with other bees and

wasps very active, these *Halicti* seemed all to be keeping to their burrows. It was not till after an hour spent in watching that I at last saw one come back laden with pollen, and it was interesting to notice that, owing to the small size of the opening of the burrow, a ring of yellow pollen was deposited around this, being scraped off as the bee entered. As every one who has examined it must have noticed, this *Halictus* is unique in appearance amongst our British species: the narrow cylindrical form of its ♀ calls to mind that of some bees which nest in straws, reeds, or stems rather than in the earth. The strongly incrassated head which blocks the small mouth of the burrow may well serve to keep out parasitic enemies, such as *Sphecodes*, which, according to some Continental observers, frequently kills the *Halictus* on which it is parasitic. The condition of the specimens obtained from the burrows was such that they could have flown very little, for the brown thoracic hairs were quite unfaded and the wings in perfect condition. From this I should assume that the species—or at least the members of this colony—is exceptionally late in moving after hibernation, as compared with other members of the genus, and the males would hardly appear before August. As mentioned above, *H. maculatus* has always been considered a very rare species in this country, though common on the Continent, but the recorded specimens show that it is widely distributed, and there is little doubt that it will be found numerously in various localities. Smith and Saunders refer only to two captures of the female by the former in their books, both having overlooked Smith's own record for 1857, which states that the ♂ was taken by Parfitt near Exeter and the ♀ by Unwin in Sandown Bay in July. Smith's own captures were made at Weybridge, Surrey, and he states in his second Edition that the ♂ has never been taken in this country! This sex has also been recorded comparatively recently.—R. C. L. PERKINS, Paignton: June 5th, 1919.

Xiphydria prolongata Geoffr. (=*dromedarius* Fabr.), bred from an artificial leg.—The following note has been received at the Entomological Department of the Natural History Museum from Mr. E. Muirhead Little, Consulting Surgeon to Queen Mary's Convalescent Auxiliary Hospitals, Roehampton: "I enclose two dead flies, which I should like identified, if you will be so kind as to do so. Their history, as far as it is known to me, is curious, and as follows: An artificial leg with a bucket or socket of willow was supplied to an ex-soldier at Queen Mary's Hospital, Roehampton. A few days afterwards he felt something pricking the skin of his stump. On examination, he found these flies' heads protruding from holes on the inner surface of the bucket. Apparently the larvae were hidden in the wood. The socket was covered with raw hide glued on and dried by a stove and then varnished. The inside was varnished with shellac. I do not think the provenance of the piece of willow in question can be ascertained." The "flies" sent are *Xiphydria prolongata* Geoffr. (=*dromedarius* Fabr.), a genus allied to *Sirex*.—R. E. TURNER, British Museum (Natural History), S. Kensington, June 5th, 1919.

Obituary.—We regret to announce the death of W. E. Sharp, on May 27th, and hope to give a detailed notice in our next Number.—EDS.

Review.

SAALAS (U.).—"Die Fichtenkäfer Finnlands. Studien über die Entwicklungsstadien, Lebensweise und geographische Verbreitung der an *Picea excelsa*, Link., lebenden Coleopteren nebst einer Larvenbestimmungstabelle." (The Spruce Beetles of Finland. Studies on the Developmental Stages, Life-History and Distribution of the Coleoptera living on *Picea excelsa*, Link., with a Key to the Larvae.) "Annales Academiae Scientiarum Fennicae," Helsingfors, Ser. A. viii, No. 1, 1917, 547 pp., 9 plates, 1 map.

The Coleopterous fauna of Finland has been relatively well worked from a systematic point of view, but biological data are almost entirely lacking. In this volume, which is the outcome of investigations carried on from 1912 to 1915, the term "spruce beetle" is used in a wide sense, even such species being included as live on other trees and only occasionally occur on *Picea excelsa*, Link. On the other hand, those beetles are excluded that are not truly arboreal, but shelter beneath the spruce bark more or less by chance. For instance, *Pyrochroa pectinicornis*, a typical birch insect, has been included because the larvae that were examined had apparently spent the entire larval stage under the spruce bark, whereas certain Chrysomelid, Curculionid and other beetles that are found under the spruce bark, especially in Autumn and Spring, have been excluded because their true habitat is elsewhere. The exceptions to this last rule are justified in the second part of this volume, in which, under an arrangement according to families, the species are dealt with singly, many details of the life-history, distribution and habitat being recorded in each case. The first part covering 276 pages deals generally with these beetles, their economic importance, distribution, food, occurrence on various parts of the spruce, and contains many tables. A number of beetles frequently found under loose spruce bark, but living in moss etc., are included, but species that live under the fallen needles on the ground are not. Beetles living in fungi growing on spruce are included, but not species that occur in some spruce stumps simply because the latter happen to be badly rotted. In a number of cases the existing literature did not afford adequate means for identification and in many of them the adult had to be bred out. The key at the end of this work is intended to enable the larvae of all the species known to the author to be identified. Of species that he is unacquainted with only a few are included owing to the difficulty in finding sure points of comparison. The number of species fully dealt with amount to 341, of which 289 were actually observed to occur, in more or less abundance, on spruce. This last figure amounts to 9·9 per cent. of the 2,927 species of Coleoptera recorded from Finland up to 1900 according to the "Catalogus Coleopterorum Faunae Fenniae" of J. Sahlberg, the author's father.

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
May 8th, 1919.—Mr. STANLEY EDWARDS, F.L.S., F.E.S., President, in the Chair.

Mr. F. H. Wolley Dod, F.E.S., of Alberta, was elected a member.

ANNUAL EXHIBITION OF "OTHER ORDERS."—Mr. Frisby exhibited (1) *Vespa doryloides*, an Eastern species nocturnal in flight, and (2) *Polyrhachis striata*, an ant armed with spines, from India. Mr. Ashdown, a large

number of *Diptera* set to show the wing-markings and pointed out that the pattern frequently showed no connection with the lines of the venation. He also showed *Cassida nobilis* from Oxshott. Dr. Chapman, living bred specimens of (1) the Solomon's Seal Sawfly (*Phymatocera aterrima*), and (2) the Apple-loving Sawfly (*Hoplocampa testudinea*); the former gnaws its cocoon to escape, the latter cuts off a lid. Mr. Dods, a "false scorpion" *Chelifer cancrioides*, found among books in a warehouse. Mr. Smith, various species of *Coleoptera*, *Neuroptera*, *Odonata*, *Hymenoptera*, and *Diptera* taken by him in the New Forest during 1914-18 in June. Mr. S. Edwards, numerous large species of Exotic *Coleoptera*, *Orthoptera*, Bees, and Pseudo-scorpions. Mr. L. A. Box, several species of *Hymenoptera*, including a specimen of *Rhyssa persuasoria*, the largest British Ichneumon, from Surrey. Mr. H. Moore, several species of Exotic Centipedes from Burmah, and *Polydesmus cingulatus* taken in Sicily by the late Mr. Platt Barrett. Mr. B. Adkin, oak branches showing the ravages of the beetle *Scolytus intricatus*. Mr. Leeds, *Aeschna cyanea* taken at Letchworth on April 27th, 1919. Mr. West, four drawers of *Hemiptera*, and also the *Hymenoptera*, *Osmia xanthomelana* from Darenth, *Andrena fulva* from Box Hill, *Eucera longicornis* from Byfleet, and several *Chrysidae*. Mr. Turner, some Exotic Phasmids and Mantids. Mr. Bunnett, a Queen Bee, with workers for comparison. Mr. Tonge, the predaceous Dipteron *Asilus crabroniformis* from Cornwall, and the bee *Anthophora acervorum* from Deal.—H. J. TURNER, *Hon. Editor of Proceedings.*

CONTRIBUTIONS TO A LIFE-HISTORY OF TARUCUS
MEDITERRANEE BETHUNE-BAKER.

BY T. A. CHAPMAN, M.D., F.R.S., AND CAPT. P. A. BUXTON, F.E.S., M.B.O.U.

(PLATES VI-XI.)

Captain Buxton has sent me (T. A. C.) from Amara, Mesopotamia, some notes on the Life-History of *Tarucus mediterraneae* B.-Baker with various material from which to add such further particulars as I can obtain from them. The chief of these are cast larval skins and larvae preserved in glycerine. From the latter I have obtained slides of the larval skins, but as I have practice in mounting such skins only from fresh larvae, they are not so successful as I could wish, largely due probably to my ineptness, but also perhaps to such material being difficult to deal with.

T. mediterraneae is one of the new species recognised by Mr. Bethune-Baker in his revision of the genus in "Trans. Ent. Soc. Lond. 1917, p. 281." The habitats he records are Egypt (Alexandria), Algeria, and Palestine. I have verified Capt. Buxton's insects as *mediterraneae* by examination of the male appendages, which agree precisely with Mr. Bethune-Baker's figure of the genitalia of that species. Mesopotamia is

therefore an extension of the recorded range of the species. It is curious that Mesopotamia and *mediterraneae* should have a similar meaning, though quite reversed in literal expression.

My own (T. A. C.) notes on the egg, larva, and pupa are as follows:—

Egg.

I received two egg-shells laid in a fork of a twig of *Zizyphus*.

The material available for the description of the egg consists of these egg-shells, the greater part of the upper surface of both is wanting, having been eaten by the larva when hatching.

The eggs are of the usual Lycaenid cheese-shape, flat above and below, the sides nearly perpendicular to the base, in this case, very little fullness or bulging, and perhaps inclining inwardly above so as to make the top of the egg rather narrower than the base. It is a small egg 0·44 mm. in diameter and 0·19 mm. high.

The sculpturing of the white adventitious coat is hexagonal (or triangular) in character, bold, and prominent. Of course, the specimens only afford examples of it on the sides. A hexagon may be selected, with high knobs at each angle, and another in the centre; they are connected with each other and with the centre one by narrow ridges of the white material hanging in (catenary ?) curves, each hexagon is thus divided into 6 triangles. Each ridge between two knobs is about 0·046 mm. long, viz. the distance apart of the knobs on the side of the egg. Any knob may be selected as the centre of a hexagon, and here and there, according to the exigencies of the curved surfaces, the hexagon is reduced to a pentagon. The knobs are well raised, and appear to have at top a central depression. The sculpturing extends a good way on the under surface of the egg, leaving only a central portion where it seems wanting. The adventitious coat does not extend to this under surface, or so slightly that the pattern here is sculpturing into cells.

The photograph of one of these egg-shells (by Mr. Tonge), fig. 1, Plate VI, shows very well the boldness of its sculpturing; it is $\times 38$ diameter.

LARVA.

I have on a slide photographed in fig. 2, Plate VI, $\times 42$, a larva, newly hatched, of a *Tarucus theophrastus*, taken by Mr. Powell at Sebdou, Oran, Algeria. In the light of Mr. Bethune-Baker's investigations, it would seem that this is as probably *mediterraneae* as *theophrastus*, so that a few remarks about it are admissible, the more that there may possibly be little difference between the two species in

this instar. Unfortunately the specimen was mounted without the skin being spread, so that there is sometimes doubt whether some hair or lenticle belong to one side or the other.

On the slide the larva is 1·2 mm. long, and does not appear to be decidedly shrunk or stretched. The head is 0·2 mm. across, has four ocelli in a curve, and one not quite central to the curve. The mandibles are, roughly, square, 0·03 mm. across; they look not unlike the front paws of a mole, the basal half smooth, the distal half divided into four fingers and a thumb, the latter short and small, the four, strong, sharp, curved teeth. The antennae have a narrow basal joint and a tolerably square (on the slide) second one about 0·007 mm. across, which carries a hair, about 0·028 long, and two very short ones, which appear however to be carried by a very small third joint. The other mouth appendages are not so easily made out, the maxillae are hidden behind the mandibles and appear to end in three nearly level processes. The labial palpi have each a minute joint (on a larger basal one?) which carries a small hair. On the body is the usual series of long dorsal hairs; these are for the most part about 0·15 mm. long, but the prothoracic pair are longer, about 0·3 mm. and those in the last segment are also long, one pair 0·4 mm. in length. These hairs all have a fine sweeping curve backwards (except the forward one on mesothorax, which curves forwards). These (and all other hairs) are very abundantly and finely spiculated, the long dorsal hairs are, however, smooth in their lower (or posterior) aspects.

On the prothorax are dorsally behind the plate a pair of long hairs, directed rather forwards than backwards, each accompanied by a short hair, there is also a long hair above the spiracle, and four not so long between the spiracle and the plate, there is a lenticle above these. On the mesothorax the dorsal hairs are represented on each side by a pair—a front one curved forwards, and just behind it one curved backwards. On this and following segments there is a lenticle below the dorsal hairs. On the following segments is one long dorsal hair on each side, usually (I do not see it in some cases) with a small hair behind and external to it. The mesothorax and all segments to the eighth abdominal have the usual three hairs below the spiracle, there is also a fine hair on the base of the prolegs, this does not appear to be spiculated. There is also a short hair in front of the lenticle. On the 5th abdominal segment there appear to be two lenticles, the additional one below the other and also on the 6th. On the 7th and 8th segments, the lenticles are very large; they are wanting on the 9th and 10th. On these are a dozen or more hairs, 4 to 6 mm. long, whose disposition the mounting of the specimen renders more difficult to describe than it always is. Fig. 3, on Plate VI, is a

photograph of the smallest larva received from Capt. Buxton, and almost certainly in the 2nd instar. The specimen is not spread in any way. The hair-bases are very evident, but the hairs, in the photograph, are very misleading, a few that contain some air are very conspicuous, whilst the others are hardly visible, and will probably appear to be quite absent in a half-tone plate. The honey-gland is present, but the indication of the fans is doubtful.

The marginal hairs are very long and very numerous. In the 3rd instar (Plate VI, fig. 4) the dorsal hairs are highly developed, there are two pairs on each segment, varying in length from 0·15 to 0·3 mm. These hairs are of considerable diameter, the longest rather cylindrical, the shorter somewhat spindle-shaped, as shown in Plate VII, fig. 5. They are abundantly spiculated throughout their length. The prothoracic plate carries a pair, a little longer and more slender than shown in fig. 5, Plate VII, and more closely spiculated. The mesothorax seems to have three pairs. The metathorax has two pairs, the forward pair long (0·3 mm.), the posterior slender and darker. The abdominal segments have two pairs each, but on the fourth a third pair is present and on the 5th and 6th, on the 7th the honey-gland and no hairs, the 8th and 9th have several such hairs not definitely in pairs. In addition to these, there are amongst and beside them some very curious hairs, about 0·05 mm. long, centrally palmate, with several long spines; these hairs vary a good deal in size and number of spines, some look as though they were empty gloves with the fingers spread, only the fingers vary in number, are very pointed, and rather irregularly disposed round the palm: the prothoracic plate possesses one of these, but they are more numerous on the abdominal segments. From this dorsal row to the lateral row are no hairs of any size. Hair-bases, mostly without hairs, but here and there with minute ones, are thickly placed: they have a dentate margin, an odd palmate hair or two, however, occurs. Near the dorsum and again near the spiracle are several lenticles, differing little from the hair-bases, except in being rather larger and having the central membranous lumen.

The lateral hairs are numerous and long, some about 0·4 mm., much more slender than the dorsal ones, and well spiculated, immediately above them is usually a palmate hair or two.

In the specimen which I take to be in the 4th instar (Plate VII, fig. 6) the dorsal hairs are of similar character to those in the third, but are larger and more numerous. The lenticles are larger, about 5 towards the dorsum, 5 or 6 near or above the spiracle. In both the 3rd and 4th instars the caltrop-like hair-bases are ranged across the segments in two

sets, an anterior and posterior, with a slight interval between them, in both also the bases of the special angular hairs of the prothoracic plate are evident, but the hairs themselves are invisible, possibly lost, probably too slender and transparent to be seen.

Fig. 7, Plate VII, represents a specimen that I take to be in the last instar. The hair-bases are very well seen, but the dorsal hairs are matted down and very transparent, so that, except that they are very much like those of the previous instars, but longer and more numerous, no details can be confidently described. The lenticles are not quite so numerous, but some very large—the lateral hairs are very long, 0·6-0·7 mm. in length. The honey-gland here, as in 3rd and 4th instars, has several large lenticles round each end, but across the dorsal space dorsal hairs are absent, nor are there any lenticles, the dorsal tract being without them.

The position of the fans is a circle, formed by about 14 or 15 hair-bases and about 0·14 mm. in diameter and the next hair-bases below are arranged as parts of a second and third circle; of course the diameter of this area only applies to this example, as in life it may be tightly closed or fully open, that in the specimen is probably that of the size when the fans are extended.

The prolegs have 10 to 12 hooks in three sizes in each of the front and back groups.

Fig. 8, Plate VIII, is the prothorax of this specimen showing the plate, the bases of the special angular hairs are conspicuous. Fig. 9, Plate IX, shows the last segments, and fig. 10 the honey-gland region, + 120, the lenticle and spiculate hair-bases are well seen. The prothoracic hairs are very numerous, long, hardly curved, and very finely spiculated.

A large lenticle is about 0·025 mm. in diameter, it consists of a dark outer circular margin, fringed with very short radiating points, 12 to 15 in number, but irregular as to size and distribution, within this circle is a broad zone of pale chitinous aspect, and in the centre a circular area $\frac{1}{4}$ to $\frac{1}{2}$ the whole lenticle in diameter, that is pale and minutely and faintly dotted. Some of the lenticles are approximately flat, others have the outer dark circle more or less expanded, conically raising the central portion. The hair-bases are rather smaller than the lenticles, angular and flat, like the lenticles they have a darker border, but this is slight, except where it projects in a stellate manner in a variable number of points, seldom more than five. The hairs they carry are very minute, rarely as long as the width of the basal plate. Sometimes the hair is a

minute baton, sometimes it is bifid, more often it carries towards its top several fine spicules.

The great variety due to both the bases and hairs having so protean forms (within narrow limits) is to some extent illustrated in Plate IX, fig. 10, and Plate VII, and fig. 5.

The ocelli are five in a curve, and a sixth near the centre of the curve. In the last instar the mandible is still rather square, the teeth are still 5, shorter and broader than in 1st stage, and the short (thumb) tooth is very small, nearly level with the others, but sunk into the margin so that the division between it and the next tooth is like a notch at the end of the margin. The labrum is a rectangular piece about 0·25 mm. wide and 1·2 long, a little hollowed in front, with three small hairs on each side and two very small processes, with an outline much the same as the last joint and claw of a leg; its posterior angles each carry a spine, probably for articulation.

The maxilla carries a two-jointed palpus and a single large joint with two minute terminal joints and a hair.

These details of the head are illustrated on Plate IX, figs. 11 and 12.

PUPA.

The small pupa is of the form usual in "Blues," such as *Plebeiodi*. It is 8 mm. long, 2·5 across thorax, 3·0 across 3rd and 4th abdominal segments, 2·1 mm. high at thorax, and 3·0 at 3rd abdominal. It has a slight waist at metathorax. From front to end of wing-cases is 6·3 mm. It is on a silken pad and is supported by the eremaster and by a girth which in the only specimen in which its position is clear is across 2nd abdominal segment. The empty case is very pale ochreous, a full pupa in spirit is darker and has darker markings on metathorax and abdominal segments. These consist of marblings, forming a dorsal and two sub-dorsal marks on metathorax and first abdominal segments. On 2nd and 3rd these are still in some degree separate, but are connected by intermediate marblings and a 4th and further segments; the darker markings are continuous across the dorsum of the segment.

The face-piece (ventral head-cover) possesses a triangular labrum, the glazed eyes are minutely and closely dotted (eye facets), the outer eye-covers have reticulations like other portions and six or eight very minute hairs. The rest of this piece is similarly reticulated and has similar minute hairs most abundant centrally. The antennae extend to the end of the wings, the maxillæ disappear beneath the antennæ at about half

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EDITED BY

G. C. CHAMPION, F.Z.S. J. E. COLLIN, F.E.S.

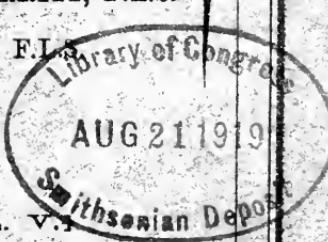
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VOLUME LV.

[THIRD SERIES—VOL. V.]



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The Chair will be taken at 8 o'clock in the evening precisely.

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their length (2 mm. from end of wings). The 2nd legs reach about $\frac{1}{3}$ of the exposed portion of the maxillae and the 1st pair about $\frac{1}{2}$. The 1st legs are broad at their base and are against the antennae for about 0·3 mm. (their total length about 1·8 mm.). The 2nd legs are about 2 mm.

Both the first legs show a lenticle about 3 mm. from the base; the 2nd legs show on one side three lenticles about opposite the point of disappearance of the 1st leg. None are detected on the opposite side. The legs show the general reticulation. The antennae also, with at short intervals (antennal joints) certain lines of the pattern running through almost transversely. The maxilla show no definite skin structure.

The wings are well reticulated, but are, as usual, without hairs, rosettes or other armature. The dorsal headpiece is narrow, 0·6 mm. across (1·2 taking both sides) and 0·2 at its widest—centrally meeting its fellow, in a suture about 0·09 long and pointed externally, it is merely reticulated. The prothorax (about 0·6 on its dorsal margin) is well reticulated, towards the dorsum are a very few hairs, further out they become numerous with a few lenticles and at its outer angle the lenticles are large and more numerous, where the hairs are abundant and close together, the reticulation is weak or absent. The hairs are short (0·08 to 0·19 mm.), but with branching spicule terminally.

On the mesothorax the spiracle-cover is about 1·1 mm. long along the suture. The usual hair-like elements look like narrow tall conical flasks, with flattish expanded tops. The dorsal suture is about 2·3 mm. long. The surface is reticulated, the branches often terminating in free ends, usually the network is continuous and closed, it is rather bolder along the line of the wing-base, there are only a few hairs, very few compared with the prothorax. The metathorax is the usual triangular piece, with the dorsal suture about 0·2 mm., and the portion representing the hind wing paler, pointed, and with only some weak reticulations. The reticulations are strongly marked in the dark central area. There are some very minute hairs comparable with those on the face-piece. The base of each is surrounded by an area about 0·06 mm. in diameter free from reticulations, making a number of paler, approximately circular, spots. There are a few lenticles towards the anterior margin.

The abdominal segments down to the 7th resemble the metathorax in reticulation and in having minute hairs in smooth areas. Round the spiracles, chiefly behind them, are areas packed with lenticles and hairs (50 to 100), the hairs of the larger pattern mentioned as seen on the prothorax. The spiracles are narrow slits surrounded by about 20

finger-like lobes radiating from its sides and ends; they are about 0·08 mm. long, the slit about half that length. Their structure is, however, obviously much more complicated than this short description suggests. The cremaster consists of about 150 anchor-hooks, the ends rounded and the points much incurved. They are about 0·04 long and rather stout.

These last abdominal segments of Lycaenid pupae are always difficult to distinguish. Here the 8th, 9th (and 10th?) are ventrally coalesced into a narrow portion about 0·07 mm. across. Dorsally and laterally what looks like 8 and 9 carry the hooks, and centrally is a clear area that must be part of 10th.

The scar of the honey-gland is very obvious in the mounted pupa-skin, but is too overloaded with dirt or debris to be fit for photographing.

The following are Captain Buxton's observations. I have added an article and verb here and there, where they had been omitted for brevity, and otherwise only a word or two that seemed more suitable when brevity was so far eliminated:—

Food of the larva, Zizyphus spina-christi (?).—A common tree in gardens and about villages—the fruit is eaten and the tree commonly planted throughout Mesopotamia. The larva, which is always to be found on the underside of the leaf, the pale dorsal streak often *not* coinciding with one of the three main ribs of the leaf, eats long patches through the lower epidermis and parenchyma, so that they show white when dry. They eat slowly forward, making grooves slightly wider than themselves. In captivity they keep to the (morphological) under surface of the leaf, even when the leaf is turned over, so presumably they choose it not so much for protection from light and enemies as because the lower epidermis is thinner and easier to eat.

The larvae feed up rapidly on young leaves, *e.g.*, a larva found June 12th, 1918, 2 mm. in length, on a slight web on the under surface of a leaf, and very lethargic, shed prepenultimate skin June 15th, penultimate on 19th, and pupated on 23rd. In general the larvae are active for Lycaenids, often quite frisky some 24 hours before moulting or pupating.

Myrmecophily.—A small black ant (*Plagiolepis pygmaea**), teste

* Mr. H. Powell has just sent me specimens of this ant, found by him attending some larvae of *Thestor ballus* at Bières, for naming by Mr. Donisthorpe, who says it is known to attend Aphides but these are the first records of its association with Lepidoptera.

Donisthorpe) is seen on the trees playing round nearly every larva. Ants and larvae were put away together in the laboratory in a damp jar with twigs of *Zizyphus*. The ants lived for at least twelve days, as isolated workers away from their nest, they were never seen to feed at the honey-gland. Once a larva was seen to run over a larva near the honey-gland, it did not stop, tap with the antennae, or anything, but a small drop exuded from the mouth of the gland. The ant took no notice and the drop remained till it dried up.

If an ant even touches a larva, at once one or both pillars (fans) shoot out, but the ant appears to take no notice. In captivity the ants were generally to be found on the same leaf as the larvae, and after pupation they similarly hung about near the pupæ. One larva lived eleven days and moulted three times, without ever having an ant near it, yet it flourished.

Pupation.—Naturally and in captivity this takes place in the hollow underside of a leaf on the tree. The leaf is not bound to the tree by threads. There is a single girth round the pupa at or about the third abdominal segment. There is a slight silk pad at the tail end of the pupa. In a few cases observed pupation took place in the early afternoon. The period in pupa is $6\frac{1}{2}$ days. (In June in Mesopotamia the shade temperature rises to 110° on many days.)

Description of Pupa.—The colour varies considerably, dorsally from very pale creamy buff to dark brown. Thorax generally darker than the rest of the dorsum. Intersegmental membranes pale. Heart as a distinct grey line pulsating visibly to the end of the fifth day. In pale pupæ, the stigmata show, being placed in dark clouds, especially the first abdominal stigma. (This should probably be second, as the first is covered by the wings.—T. A. C.) Venter of the same colour, but very pale and pellucid, the green of the leaf showing through. At the end of the pupal period the whole pupa darkens and becomes opaque, of course; the eye-caps darken and become blackish, crossed at the top by the pale line of the antennæ.

Description of Larva—Last Stage.—The general colour is pale apple-green, just the shade of the undersurface of the young *Zizyphus* leaf. Very wide “fringe” whitish, mid-dorsal ridge appearing as a distinct yellow streak, under a binocular it is seen to consist of whitish spines on a yellow ground. This streak begins at the second thoracic segment, and is widest there, and is red-brown in the middle. It runs right away to the very tip of the upper surface, barring an interruption in the honey-gland area. The honey-gland area is very slightly yellower

than the rest of the dorsum. The whole upper surface is spread with little white glistening "crow's-foot" hairs, each arising in a minute spot of black pigment, which is only seen with higher powers of binocular dissecting microscope.

The segment behind the honey-gland (eighth on the abdominal segment) has a big papilla out on the flank. The base of this papilla is covered as usual with crow's-feet growing from black specks, the summit consisting of a bladder of thin, greenish, pulsating membrane.

Pulsation is not rhythmical, and not dependent on movements of the head in feeding. Two sides pulsate at different rates, pulsations entirely irregular in amplitude and frequency, probably averaging several per second. Quite suddenly one papilla gives two or three huge pulsations and a long pillar is evaginated with glistening apical spines, the whole quite visible to the naked eye. It is soon invaginated again.

The height of the pillar is approximately six times its diameter. The under surface is of the same colour as the upper; no crow's-foot hairs. The legs are almost colourless. The head is transparent greenish, eyes black. Labrum red-brown, tips of gnathites ditto. Length, 11 mm.

In all stages but the last the larva only differs from the above in having the middle of the dorsal streak on thorax yellow, not red-brown.

EXPLANATION OF PLATES.

Tarucus mediterraneae B. Baker.

PLATE VI.—Fig. 1. Egg-shell, $\times 38$. Fig. 2. Larva of *Tarucus theophrastus*, or more probably *T. mediterraneae* (from Sebdon, Oran, Algeria), in first stage, $\times 42$; the intestine has been everted from the last segment in placing specimen on slide; all the other specimens are *T. mediterraneae* from Mesopotamia. Fig. 3. Second stage larva, $\times 42$. Fig. 4. Third stage larva, $\times 175$.

PLATE VII.—Fig. 5. One of the dorsal hairs of third stage larva, $\times 170$. Fig. 6. Fourth stage larva, $\times 10$. Fig. 7. Fifth (last) stage larva, $\times 10$. The difference in size of the larvae in the last two figures is due to the greater stretching of the larger skin. The relative sizes of the caltrops, hair-bases, and of the heads seem to confirm the determination of the instars.

PLATE VIII.—Fig. 8. Prothorax and prothoracic plate of larva in fig. 7; the bases of the special angular hairs of the plate are very conspicuous, $\times 42$. Fig. 9. Last segments of same larva, $\times 41$; the honey-gland and position of the "pillars" are evident.

PLATE IX.—Fig. 10. Honey-gland region of same larva, more magnified ($\times 120$); this figure and fig. 5 show the various forms of lenticles and hair-bases ("crow's feet," *Buxton*); the minute hairs will hardly persist in the reproduction. Fig. 11. Ocelli and jaws in last larval instar, $\times 70$. Fig. 12. The same in third instar (larva in fig. 4), $\times 120$.

PLATE X.—Fig. 13. Prothoracic plate of pupa with dorsal head-piece, $\times 42$.
 Fig. 14. Metathoracic plate of pupa, $\times 42$. It will be noticed that its position has been reversed, *i.e.*, its right-hand pointed piece (hind-wing cover) is against the mesothoracic plate, and the margin that should have been there is against the wing; the mesothoracic plate shows similar sculpturing to the metathorax, the wing-cover has only reticulations.

PLATE XI.—Fig. 15. Spiracular region of fifth and sixth abdominal segments, $\times 42$. Fig. 16. Spiracle of fifth abdominal segment further enlarged, showing lenticles, hairs, &c., and something of structure of spiracle. The photographs are all by Mr. A. E. Tonge.

Reigate.

April 1919.

ON THE TAXONOMY OF THE *HISTERIDAE*.

BY GEORGE LEWIS, F.L.S.

The part of the "Genera Insectorum" to which I referred in this Magazine in October 1915, p. 289, has now been published, and it will remain with Entomologists generally to accept or reject its peculiar taxonomy. A very few Coleopterists have specially studied the *Histeridae* and collectors abroad have had little inducement to pay attention to their capture, for which some knowledge of their varying habits is necessary. When collecting in Japan during two consecutive summers I only found a single example of *Hetaerius*.

In my note of 1915 I attributed the publication of the new taxonomy to M. P. Wytsman, but M. Wytsman later informed me that it was arranged by the late Dr. Veth, who died at the Hague in August 1917.

The dominant characters in the classification of the *Histeridae* are briefly set forth in my catalogue of 1905, first those with a non-retractile head—*Niponius*, *Trypanaeus*, and *Hololepta*, each belonging to a group very distinct in itself—and then follows the genera in which the head is retractile and during rest is concealed by a prominent prosternal lobe. The next division contains genera whose species are more heterogeneous, and have a mesosternum more or less projecting and a prosternum incised for its reception; it contains also species with the mesosternum merely bisinuous anteriorly and the prosternum not cut out at its base. *Saprinus*, again, stands apart like *Trypanaeus* and *Hololepta* by reason of the different construction of its sternal plates and of the sculpture above, which is persistent throughout the group and prevents their close association with any other.

On my way home from Japan, in passing through Paris, I gave Marseul some specimens of a *Syntelia* that I had found not uncommonly there. Marseul knew the genus and said "not one of the *Histeridae*, the anterior coxae are approximate." The same is the case with *Sphaerites*. *Niponius* has the characters of a true Histerid, but it is separated from them in the "Genera Insectorum."

30 Shorecliffe Road, Folkestone.

July 1919.

LEPTURA RUBRA L. IN NORFOLK.

BY H. J. THOULESS.

On August 6th last I captured at Horsford, near Norwich, a Longicorn beetle which was not familiar to me. It was obviously a species of *Leptura*, but did not agree with any of those previously recorded as British.

I have submitted the specimen to Mr. James Edwards, and he informs me that it is undoubtedly a male of *Leptura rubra* L. He has, with his usual kindness, furnished me with the following information with regard to this species :—In Holland it is generally distributed, but everywhere scarce; further, that Thomson says it is common in woods of conifers, especially spruce, over the whole of Scandinavia, and that Reitter, in his "Fauna Germanica," says it is very abundant on old stumps of conifers.

Mr. Edwards has supplied me with the following table of the British species of *Leptura*, which shows very clearly the position occupied by *L. rubra* :—

- | | |
|---|-------------------------|
| 1 (2) Outer apical angle of elytra rounded off | <i>tivida</i> F. |
| 2 (1) Outer apical angle of elytra produced. | |
| 3 (12) Elytra distinctly punctured; antennae black. | |
| 4 (9) Pubescence of thorax erect. | |
| 5 (8) Legs black. | |
| 6 (7) Hind tibiae short, wide, compressed, somewhat curved. | |
| | <i>.....fulva</i> De G. |
| 7 (6) Hind tibiae straight, long and thin | <i>sanguinolenta</i> L. |
| 8 (5) Legs red, at most with the tarsi blackish | <i>rufa</i> Brullé. |
| 9 (4) Pubescence of thorax depressed. | |
| 10 (11) Legs entirely black | <i>scutellata</i> F. |
| 11 (10) Femora black, tibiae and tarsi yellow | <i>rubra</i> L. |
| [12 (3) Elytra shagreened. Antennae with yellow rings.] | <i>virens</i> L.] |

He further points out that the male differs from the same sex of *L. fulva*, which it most resembles, in having the pubescence of the

thorax depressed and an oblique linear impression on each side of the hinder half, the elytra without any black at the apex, the tibiae and tarsi yellow, whilst the female has the thorax and elytra, tibiae and tarsi pale red, and sometimes two small red spots on the head.

I have good reason to judge that *L. rubra* is an old inhabitant of the Horsford district, rather than an accidental importation. It is a remote country of heath and woodland, and it is most unlikely that the beetle can have escaped from foreign timber. The ground on which it occurred has been covered with Scots pines for at least a century, as I well recollect a number of large trees being felled there over thirty years ago.

"Corfe," College Road, Norwich.

July 1919.

[I have taken this insect more or less freely in pine-woods in the French, Swiss, Italian, and Austrian Alps, in the Black Forest in Germany, in Spain, Corsica, the Landes, Pyrenees, etc., usually on Umbelliferae. It is mentioned in Stephens's "Manual," under the name *L. rubrotestacea* Ill., as having been improperly indicated as British.—G. C. C.]

ON A NEW SPECIES OF ANTONINA (COCCIDAE) FROM CEYLON.

BY E. ERNEST GREEN, F.Z.S.

Antonina zonata, n. sp.

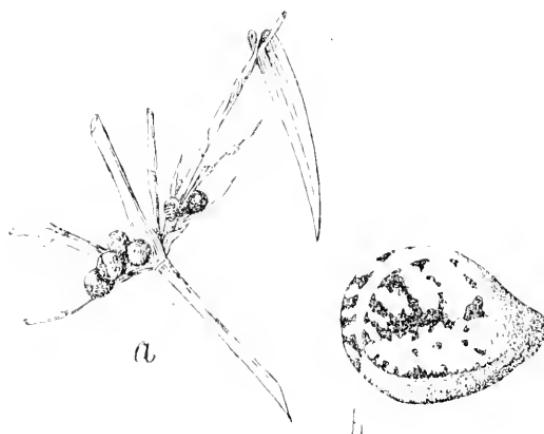
Adult female naked; not enclosed in a felted sac, but resting on a bed of whitish secretory matter; apparently globular, but actually pyriform, the anterior extremity narrower (fig. b): without any vestige of legs: at first of an olivaceous greenish colour, with dark brown zones and blotches on the dorsal area; older examples may be of a more or less uniform castaneous brown colour, when the markings are largely obscured. Antennae rudimentary, consisting of a broad, short basal joint and a longer irregularly conical terminal joint, the extremity truncate and somewhat concave, with a group of stout curved setae. Spiracles large and conspicuous. Anal ring set in a wide pit with a comparatively small, broadly oval or circular orifice, through which the anal setae project. The external orifice is surrounded by circular ceriferous pores and many stout hairs. The anal ring itself has a deeply milled circumference and bears six long stout setae.

Length 2·75–5 mm.: greatest breadth 2·5–4 mm.

Male puparium in the form of an elongate, narrow, felted sac.

On a shrubby species of bamboo (*Teinostachyum attenuatum*), Pundaluoya, Ceylon. The adult females are clustered in the axils of the smaller branches. They are seldom actually exposed, but are almost

invariably enclosed in carton shelters constructed over them by ants (*Cremastogaster dohrni*). The position and globular form of the insects give them the appearance of sessile berries growing upon the plant. The male puparia are usually concealed beneath the stipules of the bamboo.



Antonina zonata, Green.

- a. Insects, on twig of bamboo; nat. size.
- b. Adult female, side view: $\times 6$.

Though differing widely, in form and colouring, from typical species of *Antonina*, all the structural characters of the insect, and its early development, are essentially those of the genus to which it is here assigned.

Camberley.

July 17th, 1919.

GNOPHOMYIA TRIPUDIANS BERGROTH: A NEW BRITISH FLY.

BY F. W. EDWARDS, B.A., F.E.S.

In the summer of 1918 I received for identification from Dr. D. Keilin, of Cambridge University, several specimens of a fair-sized black Tipulid which evidently belonged to the genus *Gnophomyia*, but which I could not at the time name with certainty. A recent re-examination of them shows that they undoubtedly belong to the species described by Bergroth in 1891 as *G. tripudians*, from a specimen taken in Switzerland. No species of this genus has heretofore been discovered in this country, and the only record of *G. tripudians* subsequent to Bergroth's seems to be one by W. Gamkrelidze, who records (Feuille Jeunes Nat.

xliii, p. 55, 1913) finding numbers of the larvae in a fallen poplar trunk at Chaville, near Paris; he also states that the adults were numerous in the locality from spring to autumn. Dr. Keilin found the larvae very numerous under the bark of a dead oak at Mildenhall, Suffolk.

G. tripudians is one of the largest of the British Eriopterini, and, apart from its structural differences in venation, can easily be separated from every other member of the group in this country by the deep colour of the whole body, including the legs, and the strongly infuscated wings. It is somewhat remarkable that so conspicuous an insect should have remained so long undiscovered, but as every breeder of insects knows, many species which are abundant as larvae are only rarely seen as adults, and so far as this country is concerned, this may be a case in point; amongst other instances might be mentioned the fungus-gnats *Ditomyia fuscata* Mg., *Ceroptatus lineatus* F., and *Leptomorphus walkeri* Curt.—all conspicuous flies which the writer finds commonly as larvae, but has seldom seen on the wing.

London.

July 3rd, 1919.

Another note on the habits of Melanophila acuminata De Geer.—*A propos* of Dr. Nicholson's remarks on the habits of this species (*ante*, pp. 156, 157), and of those of the late W. E. Sharp on the same subject (*op. cit.* liv, 1918, pp. 244, 245), it is perhaps worth while calling attention to a recently published paper by Mr. H. E. Burke, entitled "Biological Notes on some Flat-headed Bark-borers of the Genus *Melanophila*" (*Journ. Econ. Ent.*, Concord, N. H., xii, pp. 105–108, Febr. 1919). This article deals with several American species of the genus *Melanophila*, including the holarctic *M. acuminata*. Mr. Burke writes as follows:—"Generally there is one generation in a year. Adult beetles emerging from the trees in spring and summer of one year lay eggs that hatch into larvae which live through the winter and pupate, emerging as adults in the spring or summer of the following year. Sometimes, however, a number of larvae of one generation will remain in the pupal cells for several years before pupating. The larvae of these beetles mine the inner bark and outer wood and pupate there, the eggs being laid in the crevices of the bark. The adults usually feed on the bark or foliage of the host-trees, but *M. consputa* has been observed devouring scorched termites. With the exception of one individual of *M. acuminata* reared from Monterey cypress, all the American species of *Melanophila* appear to be confined to food-plants of the family *Pinaceae*. The larval characters indicate that the genus should be divided into two. . . . *M. acuminata* De G., with which *M. longipes* Say and *M. atropurpurea* Say are apparently identical,* prefers to attack dead or dying trees scorched by fire. . . . The only known method of dealing with these beetles in the forests is the burning of the infested wood and bark before the adults emerge." Larvae were found by

* Another synonym is *M. obscurata* Lewis, from Japan (*cf. Ent. Mo. Mag.* liv, p. 200, 1918).

myself in 1909 under scorched pine-bark at Woking, and one of the largest of them was figured in this Magazine (*ante*, vol. xlvi, pl. 4, figs. 5, 5a, 1910), but neither W. E. Sharp nor Dr. Nicholson appears to have met with the insect in its earlier stages.—G. C. CHAMPION, Horsell: *July 10th, 1919.*

Aleochara egregia Rye and *Ocyphus cyaneus* Payk. in Norfolk.—It is of interest to record the capture of these *Staphylinidae*. A ♀ specimen of the former was taken on June 3rd at the entrance to a rabbit burrow and the latter on a road on June 25th, both at Sheringham, Norfolk.—M. CAMERON, 7 Blessington Road, Lee, S.E. 13: *July 1st, 1919.*

[The *Aleochara* (*Homolota*) has remained unique as British since the capture of a single specimen at Caterham, Surrey, by myself, on June 3rd, 1873 (Ent. Mo. Mag. xii, p. 176, 1876). The *Ocyphus* has been recorded in recent years from the Eastern Counties (Norfolk, Suffolk, and Essex), Oxford, Scotland (Nairn and Grantown), etc.—G. C. C.]

Coleoptera of the Brighton District (continued from Ent. Mo. Mag. 1918, p. 211).—Since last July I have done very little collecting, but some of the species which have turned up may be worthy of notice. I have divided the district as before into: The Chalk downs, the small woods on the downs, the alluvial river valleys with their networks of ditches and streams, and the Wealden area. Mr. E. A. Elliott and the late Mr. W. E. Sharp have been very kind in identifying several of the specimens for me, and the Rev. C. E. Tottenham has given me great assistance by sending named insects. I would like to take this opportunity of offering them my sincerest thanks. Owing to lack of time many groups have been very little "worked"; the *Staphylinidae* and water-beetles, for example, have received very little attention.

(1) *The Chalk downs and the beech copses on them.*

Amara apricaria, several in mud-cracks at the bottom of a dried-up dew-pond; *A. antica*, under a stone, Stanmer. *Olisthopus rotundatus*, one under a stone in a chalk-pit. *Noterus clavicornis* was very plentiful in a pond on the Newhaven cliff, with several *Rhantus punctatus*. I have at last found *Necrophorus respillo*, of which there were several in a dead mole at Stanmer. Though this is often supposed to be the most common species, I have never taken it before, either in Sussex or Berkshire. *Omosita discoidea*, one in a sheep's skull at Stanmer. *Cis boleti*, under beech-bark. *Rhizobius litura*, several by sweeping at Stanmer. *Quedius molochinus*, I found the pupa of this insect at the root of a clump of heather, the beetle emerged in May. *Cafius xantholoma*, one under a stone at "Black Rock." *Aphodius rufus* and *A. sticticus* each made a few appearances in *stercore equino*, also a specimen each of *Ondophagus ovatus* and *O. fructicornis*. I picked up a ♂ *Drilus flavescens* on the London road, and on the same day I got two more by sweeping outside a beech wood near Lewes (vi.1919). *Grammoptera ruficornis*, not common, Stanmer. *Timarcha tenebricosa* has, unlike other years, been quite abundant on the downs and outside woods this year. *Chrysomela staphylea*, by sweeping in Stanmer Woods. *Psylliodes dulcamarae* has turned up once at Stanmer, and on the same day I got a single *Centhorrhynchidius horridus* (viii.1918).

(2) *The River Valleys.*

Agonum viduum, on banks of R. Ouse, occasionally; var. *moestum* at Southwick. *Haliphus fulvus*, Newhaven. *Gyrinus bicolor*, not common at Lewes. *Astilbus canaliculatus*, under a stone, amongst ants, near Newhaven. *Coccidula rufa*, on the bank of the Ouse near Lewes. *Onthophagus vacca* is found occasionally in cattle pastures near the Ouse and Adur. *Hydrothassa marginella*, common at Lewes. *Hippuriphila modeeri* and *Donacia sericea* were swept up at Lewes in May.

(3) *The Wealden Area.*

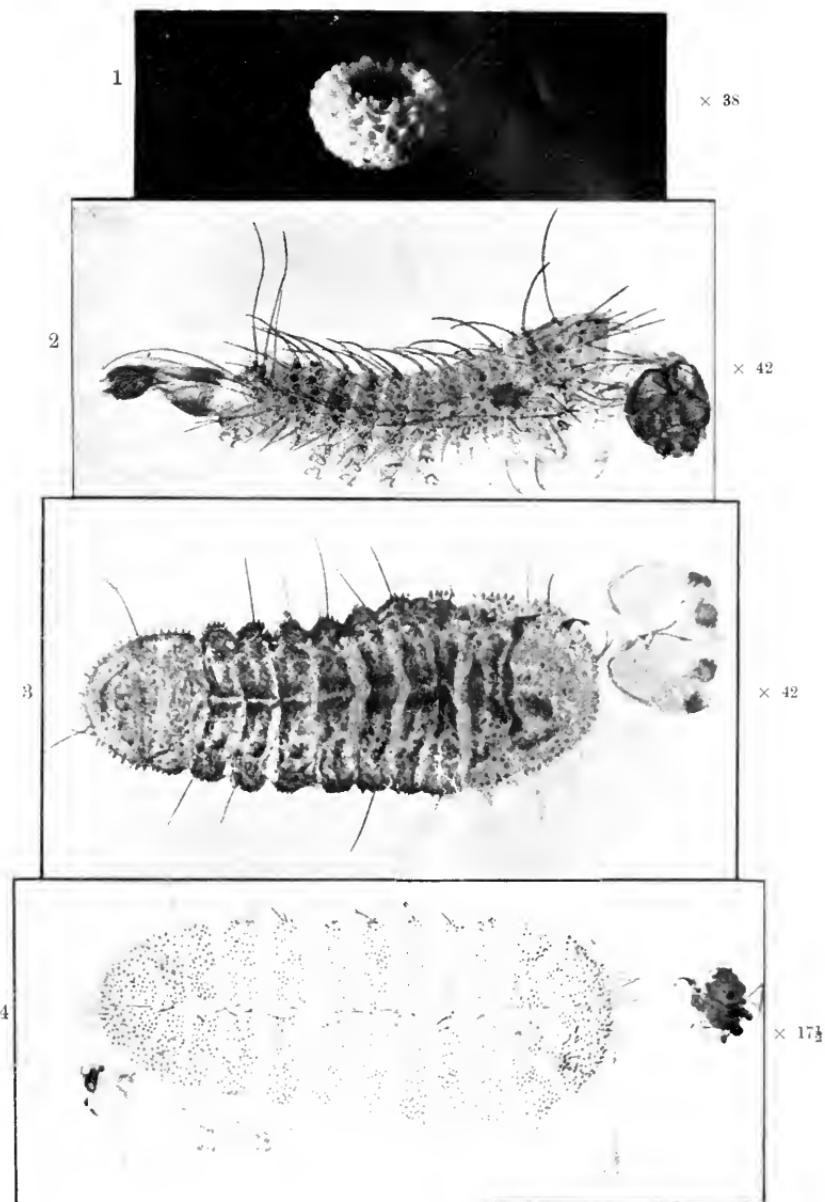
I was surprised to meet with countless *Elaphrus riparius* in a baking-hot sandpit near Hassocks early this summer. At the base of the sides of a similar sandpit (Upper Neoconian) north of Worthing, dead and living specimens of *Byrrhus pilula* were lying about in heaps, and quite darkened the ground in many parts of the quarry. *Bembidion 4-maculatum*, on the bank of a pond on ChAILY Common in April. *Acupalpus meridianus*, at Uckfield in May. *Amara fulva*, *Stomis pumicatus*, and *Pterostichus strenuus*, though common, are species that have not fallen to my lot previously to this spring. *Agabus biguttatus* occurred in a small roadside ditch in considerable numbers. *A. chalconotus* appears to be the only beetle that can live in the iron-laden water of some of the ponds on ChAILY Common; in these ponds a thick red deposit is formed on the aquatic plants and gives them a most unnatural appearance. *Copelatus agilis* made two appearances at Holmbush in an otherwise unprolific pond. *Helochares grisens*, fairly common. *Silpha thoracica* was crawling about in fair numbers round some decaying animal matter near Heathfield. *Lathrobium elongatum* occurred abundantly at Holmbush in April. *Cytilus sericeus* and *Lochmaea suturalis*, one of each, ChAILY Common (iv.1919). *Melandrya caraboides*, on a tree at Maresfield (viii.1918). *Helops striatus*, under bark in a wood north of Worthing.—GEORGE B. RYLE, 6 Chesham Place, Brighton: July 18th, 1919.

Some Coleoptera taken in Somersetshire.—The following list includes a few of the more interesting species of beetles taken on occasional opportunities for collecting during 1914–15 and the early part of 1916. The majority were found in the neighbourhood of Long Ashton (L. A.), within four or five miles of Bristol.

Anchomenus piceus L. (Burnham), *Stenolophus respertinus* Panz. (Nailsea), *Bembidion pallidipenne* Ill. (under seaweed at Burnham), *B. concinnum* Steph. (L. A.), *B. tibiale* Duft. (L. A.), *Brychius elevatus* Panz. (L. A.), *Hydaticus transversalis* Berg. (Burnham). *Cymbodita ocalis* Thoms. (Nailsea), *Berosus luridus* L. (Burnham and Nailsea), *Linnebius nitidus* Marsh. (Burnham), *Chaetarthria seminulum* Herbst (Minehead), *Hydraena nigrita* Germ. (L. A.), *H. palustris* Er. (Burnham), *Cyclonotum orbiculare* F. (in company with *Chaetarthria*). *Staphylinus caesareus* Cederh. (Burnham), *Eusphalerum primitiae* Steph. (L. A., very abundant each year in primroses), *Phloeobium clypeatum* Müll. (L. A.), *Prognatha quadricornis* Lac. (L. A.). *Agathidium nigripenne* Kug. (under bark, L. A.), *Anisotoma calcarata* Er. (L. A.), *Choleva morio* F. (L. A.), *Lycoperdina bovisetae* F. (a single specimen taken under a small stone at the base of a tree, near Tickenham; no Lycoperdons or

other likely fungi could be found near by), *Dacne rufifrons* F. (L. A.), *Orthocerus muticus* L. (sand-dunes at Burnham), *Cerylon histeroides* F. (L. A.), *Saprinus maritimus* Steph. (in holes in the sand above high water-mark at Burnham), *Abraxus globosus* Hoffm. (L. A.), *Pocadius ferrugineus* F. (in Lyco-perdons, L. A.), *Rhizophagus perforatus* Er. (L. A.), *Monotoma spinicollis* Aubé (Nailsea), *Cartodere ruficollis* Marsh. (in dried bracken, L. A.), *Pediatus depresso* Herbst (under bark of Conifer, L. A.), *Diphyllus lunatus* F. (in fungus, *Daldinia concentrica*, on ash at Failand), *Triphyllus suturalis* F. (L. A.), *Litargus bifasciatus* F. and *Mycetophagus atomarius* (in company with *Diphyllus* at Failand), *Elmis acutus* Müll., *E. volkmari* Panz., *E. subviolaceus* Müll., *E. cupreus* Müll. (on stones in small streams at L. A.). *Sinodendron cylindricum* L. (dead apple tree, L. A.), *Onthophagus nuchicornis* L. (Burnham), *Psammobius sulcicollis* Ill. and *Aegialia arenaria* F. (both common on sand-dunes at Burnham), *Throscus curvifrons* Bony. (evening sweeping, bracken, L. A.), *Malthinus frontalis* Marsh. (L. A.), *Malthodes dispar* Germ., *M. fibulatus* Kies., *M. atomus* Thoms. (L. A.), *Hedobia imperialis* L. (on the wing, L. A.), *Dryophilus pusillus* Gyll. (beating oak, L. A.), *Anobium fulvicorne* Sturm (Tickenham), *Ernobius mollis* L. (L. A.), *Ochira hederae* Mull. (ivy, L. A.), *Cis fuscatus* Mull. (L. A.), *Eunearthron affine* Gyll. (L. A.). *Tetrops praeculta* L. (L. A.), *Lochmaea suturalis* Thoms. (Minehead), *Phyllotreta tetragyna* Com. (under bark of pollard willows, Athelney). *Helioptilus gibbus* F. (sand-dunes at Burnham). *Microzonum tibiale* F. (Burnham). *Mordellistena abdominalis* F. (L. A.), *Anaspis pudicaria* Costa, *A. rufilabris* Gyll., *A. geoffroyi* Mull. (L. A.), *Metacanthus paradoxus* L. (L. A.—wasps' nest). *Brachypterus varius* F. (sweeping long grass under trees, L. A.), *Otiorrhynchus rugifrons* Gyll. (Portishead), *O. oratus* L. (Burnham), *Barynotus elevatus* Marsh. (L. A.), *Alophus triguttatus* F. (L. A.), *Sitones griseus* F. (Burnham), *Rhamphus flavicornis* Clairy. (L. A.), *Dorytomus pectoralis* Gyll. (L. A.), *Tanysphyrus lenae* F. (Failand), *Gymnetron pectorale* Gyll., *G. villosulus* Gyll., and *G. beccabungae* L. (L. A.), *Cionus blattarice* F. (L. A.), *Poophagus sisymbrii* F. (Nailsea), *Liodactylus leucogaster* Marsh. (Nailsea), *Rhyncolus lignarius* Marsh. (L. A., in dead elm-stump). *Scolytus multistriatus* Marsh. (L. A.), *Hylastes ater* Payk. (L. A.), *Hylesinus crenatus* F. (L. A.), *Pityophthorus pubescens* Marsh. (in dead fir twigs, L. A.), *Trypodendron domesticum* L. (L. A.).—C. T. GIMINGHAM, Long Ashton, Bristol: June 26th, 1919.

Calosoma sycophanta L. at Exmouth.—The following note is taken from a recent issue of a West Country newspaper. "The Rev. A. C. Morris, of Exbourne Rectory, writes:—A Continental beetle, which is occasionally caught in England on the coast, was discovered last week at Exmouth, on the sands, by a young member of the Exbourne Scouts, Douglas Morris. The beetle is *Calosoma sycophanta*. It is probable that the specimens which are occasionally caught in England come from France. The beetle is a strong flyer, and the fact that it is sometimes found a few miles from the coast floating in the water, points to its being a migrant. The specimen caught is perfect, and the green and golden wing-cases are over an inch in length and nearly three-quarters of an inch in width. The gale probably assisted it in its passage across the Channel." It may be remembered that one or two examples have been captured in the New Forest during recent years.—EDS.



Photo, by A. E. Tonge.

TARUCUS MEDITERRANEEAE B.-BAKER.

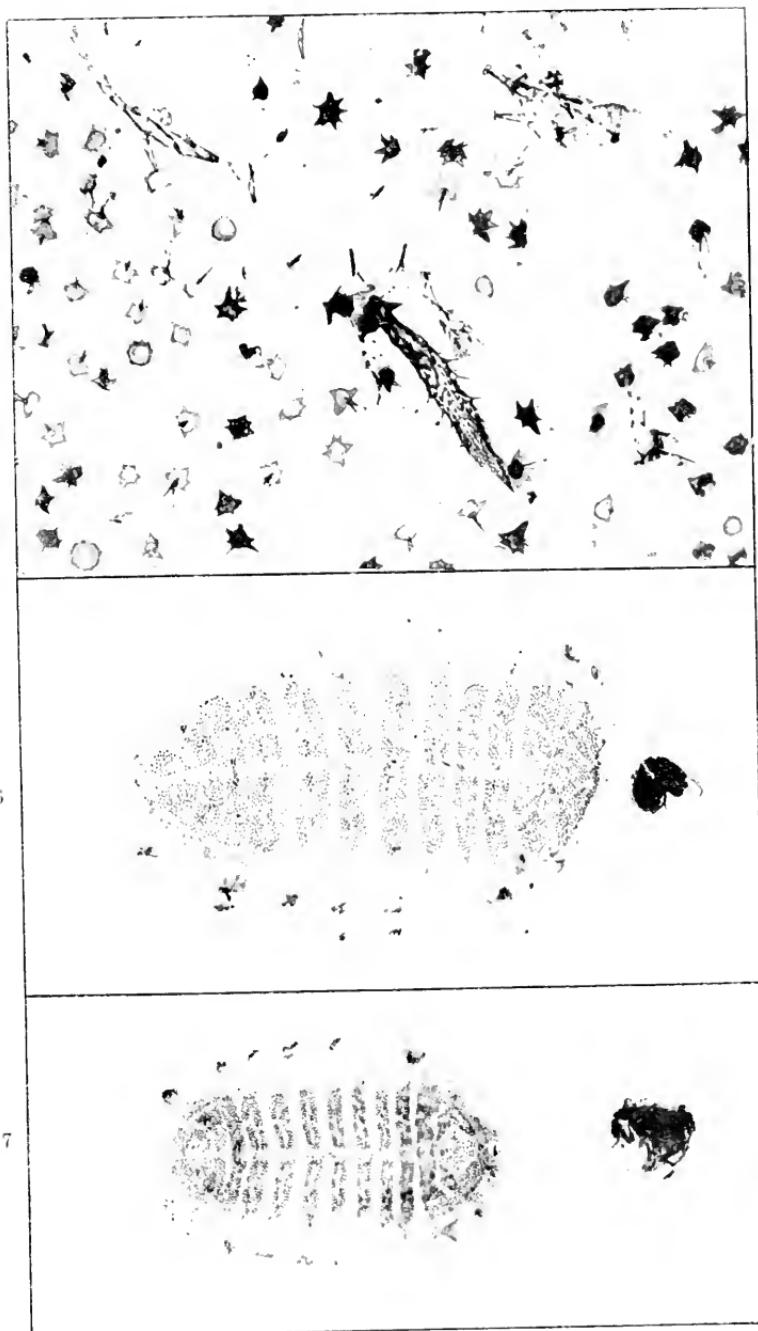
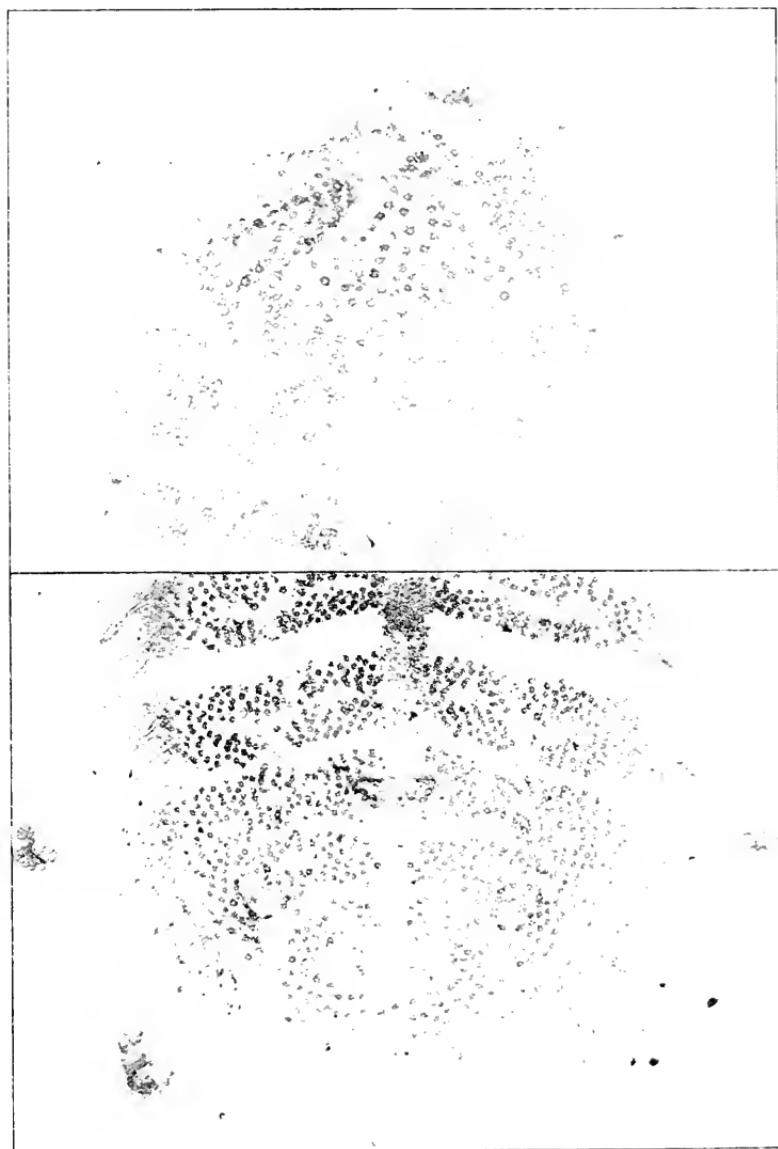


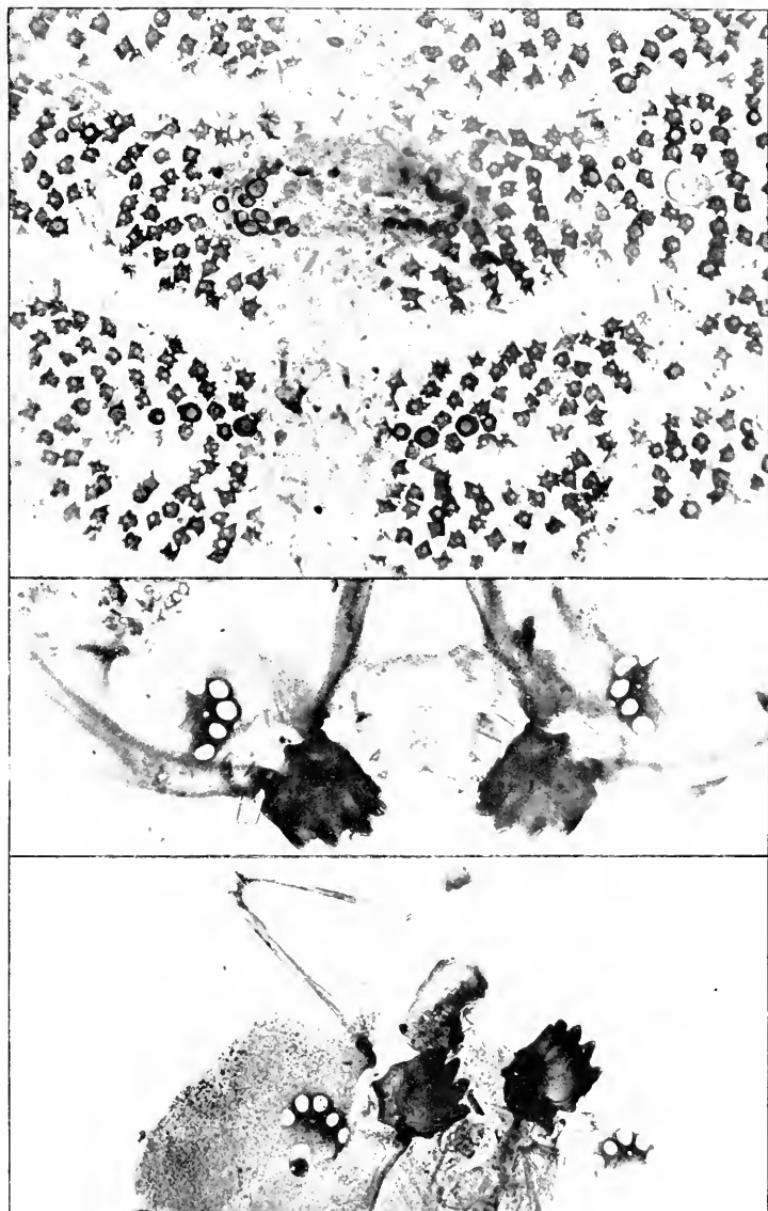
PLATE VII. A. E. Temple

TARUCUS MEDITERRANEEAE B.-BAKER.



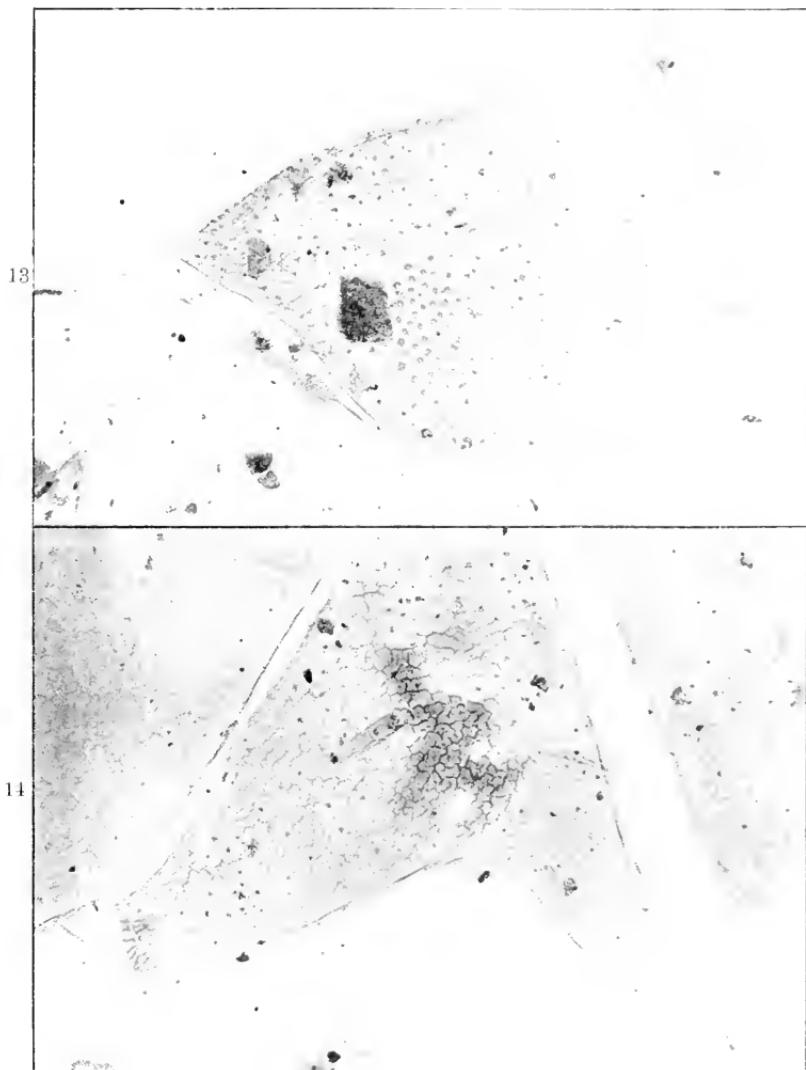
Photo, A. E. Tower.

TARUCUS MEDITERRANEEAE B. BAKER.



Photo, by A. E. Tong

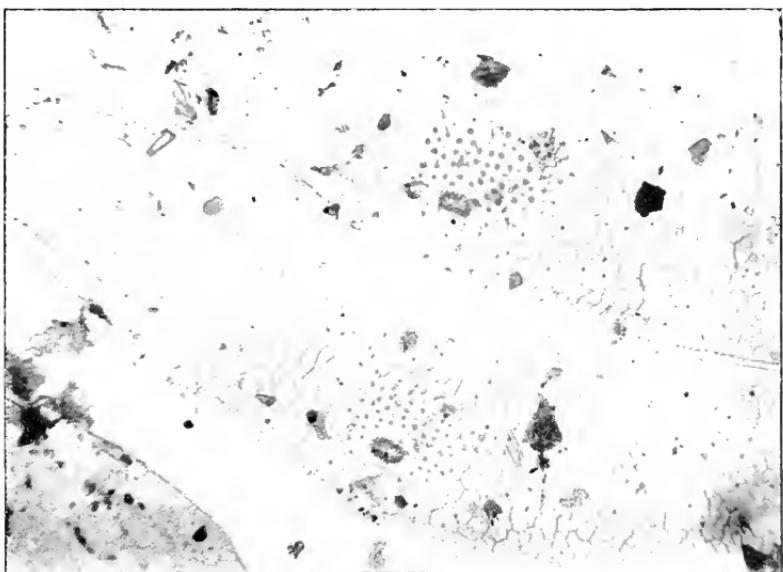
TARUCUS MEDITERRANEEAE B.-BAKER.



Photo, by A. E. Towne.

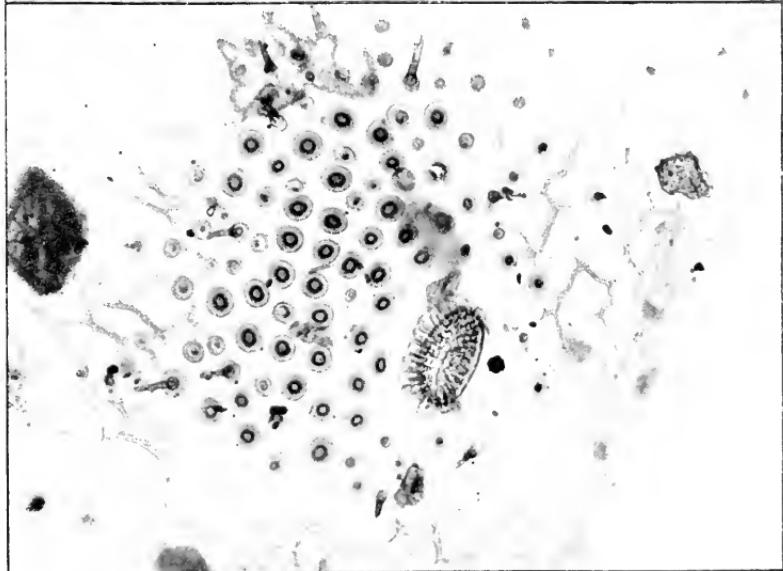
TARUCUS MEDITERRANEEAE B.-BAKER.

15



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16



170

Photo, by A. E. Tonge.

TARUCUS MEDITERRANEEAE B.-BAKER.

Andrena dorsata K. and *A. similis* Sm. stylopized.—To my list of stylopized bees (Ent. Mo. Mag. 1918, p. 115) I am now able to add two other species. During the last week in March my brother picked up a female *A. dorsata* K. in East Devon and sent it to me, suspecting that it was stylopized. This specimen contains two female Stylops, which appear similar to those found in *A. ovatula* (*afzeliella*) and *wilkella* K. The bee itself is much changed in respect to the pollinigerous apparatus; the pollen basket formed by the curved hairs of the propodeum is greatly reduced and the scopae are also in a deteriorated condition. The hind tibiae are red at the apex, as is usual in examples of the second or summer brood of this *Andrena*, but this colour is sometimes found in healthy examples of the spring brood. A single stylopized male of *A. similis* Sm. was taken in April. This also is much changed by the parasite, and in fact might easily be mistaken for some other species. The characteristic rugulosity of the abdomen is lost, and this has become conspicuously shining or polished. In fact, to the naked eye the specimen has somewhat the appearance of a small example of *A. polita* Sm.—R. C. L. PERKINS, Paignton: June 4th, 1919.

Sirex juvencus in New Zealand.—Last month Mr. F. G. Moore of Masterton, Wairarapa, North Island, New Zealand, submitted to me, for identification, two specimens of the well-known European *Sirex juvencus* and stated that his son had observed two others in the neighbourhood of Masterton. This fine insect is a very striking addition to our rather meagre Hymenopterous fauna. It has no doubt been introduced amongst imported timber.—G. V. HUDSON, Hillview, Karori, Wellington, New Zealand: April 23rd, 1919.

Note on the "nymph" of Melampsalta cingulata.—Whilst digging up a currant garden, which had been neglected for about five years, I discovered several full-grown "nymphs" of *Melampsalta cingulata*. These should apparently have emerged during the last summer. Although our past season was very exceptionally cold, wet, and boisterous, the autumn was fine and, so far as I am aware, the imagines of *M. cingulata* were about in normal numbers. It is clear, however, that the individuals I disturbed to-day will not now emerge until next November or December, at the earliest, as *M. cingulata* is never on the wing before that time and its period of greatest abundance is late February or March. This observation may be of some interest as indicating the fact that *Cicadæ* may remain over a season in the "nymph" state.—G. V. HUDSON: May 22nd, 1919.

Insects and Fungi on Grass Land.—The following note, published in the "Gardener's Chronicle," London, lxv, No. 1680, March 8th, 1919, p. 114, is of interest to economic entomologists:—On a piece of grass land broken up for cultivation in 1918, the local pests were *Amphimallus* (*Rhizotrogus*) *solstitialis*, *Melolontha melolontha* (*vulgaris*), *Tipula* (leather-jacket), *Feltia* (*Agrotis*) *evelationis*, and *Euxoa* (*A.*) *segetum*, the last two cutworms being most destructive to cabbage, parsley, and potatoes. Some other insects were present, but they disappeared with the destruction of their food or shelter and were not injurious to the vegetables. Imported pests, or those that invaded the new feeding-ground were: *Phorbia* (*Anthomyia*) *brassicae* (cabbage fly) imported on

seedling cabbages; *Pegomyia hyoscyami* (*A. betae*) on beet; *Hydemyia antiqua* (*A. ceparum*) on onions; *Anthomyia radicum* on radishes; *Acidia heraclei* (celery fly) on parsnips; *Psila rosae* (carrot fly) and *Ceuthorrhynchus sulcicollis* (cabbage-gall weevil); *Orygia antiqua* (vapourer moth) on plane trees; *Aphis rumicis* (black aphid) on broad beans, and *Brevicoryne* (*A.*) *brassicae* (cabbage aphid) more or less destructive to cabbages; and *Depressaria discipunctella* (*pastinacella*) injuring parsnip leaves.—Eds.

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: May 22nd, 1919.—Mr. STANLEY EDWARDS, F.L.S., F.E.S., President, in the Chair.

Dr. Chapman exhibited living specimens of *Trypodendron domesticum*, a beetle which burrows into the bark and wood of beech, oak, etc., from Netley Heath. Mr. Bunnett, the nut weevils *Balaninus nucum*, *B. glandium*, and *B. tessellatus* from Keston, and the rare *Megatomia undata*. Mr. Syms, living larvae of *Strymon pruni*. Mr. Ashdown, the rather scarce beetle *Ptinus serpunctatus*, *Attagenus pellio* with supplementary spots, and two *Hylobius abietis* showing much difference in size. Mr. Hy. J. Turner, *Colias edusa* from Cyprus with dusky blotches at base of fore wings, and several *Pontia daplidice* from Catania and Cyprus to show the range of aberration below. Mr. Edwards, the Siricids *Sirex gigas*, *S. jurevensis*, and *S. noctilio*. Messrs. R. Adkin and W. West, species of *Lepidoptera* and *Coleoptera* injurious to trees. Mr. Edwards, diagrams illustrating the life-history of *Hylurgus piniperda* (Coleopt.). Mr. Main, lantern-slides of details of various insects destructive to timber. Mr. B. Adkin read a paper, "Insects Injurious to Forestry." A discussion followed, especial note being made of the negligence of the authorities in allowing the huge quantities of *debris* of the recent felling to lie so long and thus form convenient harbour for multitudes of insect and other pests.

June 12th, 1919.—The President in the Chair.

Mr. J. A. Humphreys, of Hampstead, was elected a member.

Mr. Mera exhibited bred melanic *Hibernia defoliaria* with black females from Epping Forest from a melanic female; and living larvae of hybrid *Tephrosia biundularia* \times *crepuscularia* with larvae of the first for comparison. Mr. West, the beetles *Anthocomus terminatus* and *Georyssus pygmaeus* from Wicken Fen. Mr. Ashdown, the beetles *Mordellistena abdominalis* ♀ and *Tetropium gabrieli* from Box Hill. Mr. Tatchell, a bred *Melitaea cinxia* destitute of markings on disc of fore wings. Mr. Bunnett, a *Rhaphidia*, and the sawfly of the privet. Mr. Sperring, bred *Pararge aegeria* var. *eyerides* from Peterborough with a large blotch of colour in the space between the apical blotch and the next in the series. Seasonal notes were given by the members.

June 26th, 1919.—The President in the Chair.

Mr. K. G. Blair exhibited living *Chrysomela distincta* with ova and larvae on toadflax; on behalf of Mr. Campbell Smith, *Cetonia aurata* from Berks; and on behalf of Mr. G. Wright, *Lytta vesicatoria* from Norfolk, giving

particulars of the life-history of the last-named. Mr. Neave, for Mr. Tatchell, a pupa of *Apatura iris* from the New Forest. Mr. H. Main, the beetle *Necrophilus resplito* and larvae, and ova of *Melolontha vulgaris*, and gave notes on the life-histories. Mr. Ashdown, a living *Hylophila bicolorata*, larvae of *Diaphorina mendica*, and a larva of *Drepana binaria (hamula)*, all from Surrey. Mr. Barnett, on behalf of Mr. Coppard, larvae of *Cerura fureuta* from Limpfield. Mr. Step, larvae of *Gonepteryx rhamni* and cocoons of its Dipterous parasite from Wisley. Mr. Edwards, conspicuous species of Exotic *Theclidae*, S. American and Indian. Mr. Dennis sent natural history notes from Llanbeis.

—HY. J. TURNER, *Hon. Editor of i-roceedings.*

ODONATA FROM MESOPOTAMIA.

BY KENNETH J. MORTON, F.E.S.

(Concluded from p. 151.)

(PLATE V.)

9.—*Orthetrum sabina* Drury.

A series of both sexes, May 2nd to May 15th and June 12th; August 17th & September 12th, ♀ ♀ only, Amara (*Evans*); December 7th, 1918, 1 ♀, Ruz Canal near Shahrabani north-east of Baghdad (*Evans*).

The August–September examples appear to be quite fresh.

"First seen on May 2nd, 1918, on Masharra Canal banks. Not particularly numerous then or since—about a score or so usually to be seen. The species is difficult to catch. In life the pale bandings on the body are of a pale slate- or blue-grey, which with the enlarged dark end of the abdomen with white extremity (appendages) gives the insect a fine appearance. When in flight it is particularly difficult to see. It rests on stems of reeds and grasses growing in the shallow flooded parts of the canal margin. The wings are spread and usually tilted slightly downwards from the horizontal" (5.v.1918). "Common now" (27.v.1918). Occasional specimens still to be seen in October and November at Amara (*Evans*).

This species has a very extensive distribution—India and the far East; has also been taken in Somaliland, Suez, Syria, Cyprus, and Turkestan. Mesopotamia is accordingly quite within the limits of its range, although it does not appear to have been previously recorded from that region.

10.—*Orthetrum trinacria* Selys.

8 ♂♂ and 8 ♀♀ from May 2nd to May 15th, 1918, Amara (*Evans*); 1 ♂, Qurnah, River Tigris, May 17th, 1918 (*Buxton*); the

localities specially noted by Evans, margins of the Masharra Canal, barley-fields near Chahala below Amara, and large marsh twelve miles below Amara. The specimens are all more or less mature, the males all showing pruinosity, and the females also partially pruinose. Practically all the specimens taken in the first half of May, but reported common by May 27th. No further indications are given as to the duration of the species beyond the remark by Evans (5.ix.18), "None seen recently."

I think there can be no doubt about the identification of these specimens with *O. trinacria*. They differ somewhat from Egyptian examples in their opener venation; in Rs-Rspl there is not regularly a double row of cells, but only occasional double cells. Excepting the old Sicilian records, the distribution of the species as hitherto known has been exclusively African, including Madagascar.

Evans, in lit. 5.v. 18, says: "First seen May 2nd, 1918, and is now more abundant than *O. sabina*, but not very much so. A beautiful creature in life, but very difficult to obtain. It inhabits the same spots and behaves in the same way as *O. sabina*, but the wings are held almost horizontal. In life the male differs from the female in the latter having green stripes on the thorax, which are absent in the male." (This apparent difference is probably due to the males being more pruinose.)

11.—*Orthetrum taeniolatum* Schn.

3 ♀ ♀, November 14th and 20th, 1918: on rocks, Table Mountain, Jebel Hamrin, near Ruz (Evans); all rather immature specimens.

CROCOTHEMIS.

Ris (Coll. Zool. Selys, Libellulinen, p. 540), admittedly as a matter of convenience, treats *Crocothemis erythraea* and *C. servilia* as two separate species, the former including those from the Western palearctic region, eastward at least as far as Kashgar, and Africa with Madagascar; the latter those from India, Indo-Malaya to Celebes, New Guinea, the Philippines, China, Formosa, and Japan.

The Western forms considered under *C. erythraea* seem to be fairly homogeneous, but a more puzzling complex is revealed when those associated under *C. servilia* come to be dealt with. McLachlan seems to have tackled the problem repeatedly, and wrote that he had again tried probably for the seventh time, "but once again," he says, "I have failed to find any certain structural characters," adding, "some other investigator may be more fortunate."

Krüger (Stett. Ent. Zeit. 1902, p. 122) believed that a specific difference existed, which, however, was still to be found. He suggests

that *C. servilia* might be divided into a Northern (China-Japanese) and a Southern (Indo-Malayan) race, the first of more considerable and the second of smaller size of the abdomen and the wings. If in the future no satisfactory specific distinction were found between *C. servilia* and *C. erythraea*, then the latter must be considered as a third or Western (European, West Asiatic, African) race of *servilia*.

It may be worth repeating Krüger's remarks on the Indian forms as having a close bearing on the examples from Mesopotamia: 1st, in Bengal forms occur which thoroughly resemble those from Sumatra; 2nd, here (*i.e.* in India) the form *C. soror* Ramb., is at home, which, according to Kirby, is common in Ceylon, India, and North-west India, and which Kirby calls the Indian form of *C. erythraea*, Brullé; and, 3rd, also the real *C. erythraea*, Brullé, if not in India proper, present at least in Kashmir, according to Calvert, and farther away in Central Asia, according to Brauer (Turkestan, Jarbasch, Taschkent), Selys (Turkestan, Lob Noor, Oase Keria), and Ris (Kashgar Darja).

Ris refers to examples from Nepaul and Assam as belonging doubtfully to *C. erythraea* or *servilia*, and he evidently regards as intermediate forms Rambur's type of *C. soror* and Kirby's *soror* from Murree and Campbellpore and the same author's *C. reticulata*, also from Campbellpore. He sums up the results of his study of the *C. servilia* series in something like the following terms. The possibility of a subdivision of this series shows itself in the following way: (*a*) the Himalaya examples (*soror* Rambur) as a transition group to *erythraea*; (*b*) the great principal group comprising Ceylon, India, Burma, Southern China, Formosa, Malacca, and the Archipelago, out of which stands (*c*) the form from Java and Lombok, distinctly marked by the reduction of the basal spot; (*d*) the form from Middle and Northern China (*servilia* typical), and (*e*) the form from Japan, which is distinguished through its great size, analogous to other insect forms from the same region.

In his table of the species of *Crocothemis* Ris (Coll. Selys, p. 533) separates *C. erythraea* and *C. servilia* thus:—

Wings relatively broader (*e.g.*, hind wing 30, breadth at anal loop 10 mm.), apex of wings of both sexes normally hyaline. Abdomen of the ♂ scarlet-red, of the ♀ yellowish brown; without dark markings in the ♂, exceptionally with dark dorsal carina of segments 7–9 in the ♀ *C. erythraea*.

Wings relatively narrower (*e.g.*, hind wing 31, breadth at anal loop 9·5 mm.), apex of wings of ♂ narrowly and of the ♀ mostly more broadly margined with brown. Abdomen of the ♂ red, of the ♀ yellowish brown; dorsal carina, at least on segments 8–9, mostly even further forward, darkened with brown or blackish, more strongly in the ♀ than in the ♂ *C. servilia*.

In dealing with the forms of *Crocothemis*, an explanation of indefinite conclusions regarding them is sometimes ascribed to inadequacy of material. As, however, these insects usually bulk rather largely in collections sent home, it is not, as a rule, dearth of quantity from which difficulties arise, but rather from the want of exactly parallel series in respect of age and quality of preservation. Further, no satisfactory data are available with regard to size so far as this may be the result of seasonal variation in the case of forms having two broods or having a succession of emergences. Again, nothing is known, or appears to have been written on the subject of variation in colour in connection with the different terrestrial conditions in which the imagines live, *e.g.*, whether the duller reds in certain surroundings never become scarlet, or whether the pale interalar and shoulder-stripes, which are usually evanescent, may not in certain circumstances persist practically throughout life, as seems not improbable.

The present collection is of importance inasmuch as it contains examples of the genus taken in nine different months of the year. The hiatus between June 29th and August 17th is unfortunate but intelligible, Captain Evans reporting a shade temperature of 115° F. on July 2nd, rising to 119° more than once during that month, and on August 8th that it was still too hot during the day for collecting.

12.—*Crocothemis erythraea* Brullé.

2 ♀ ♀, March 23rd and May 15th; 1 ♂, April 28th, 1918, all at Amara by Captain Evans. It may have been the same species to which he refers in a note: "I saw yesterday, 21st April, a single *Crocothemis*, by the river downstream, which was of a beautiful crimson colour. I could not obtain it however."

Without any previous knowledge of these insects, Captain Evans seems at once to have detected the difference between this and the other commoner form. He reports regarding the ♂: "Captured while resting on a twig overhanging a rough well or pool in a palm garden by the Masharra Canal. In colour the specimen was redder than any others seen, and differs from other males in the following points: The eyes were blue in the outer third of their surface, merging through purple into the dark red of the remainder. No shoulder-stripe. The wings without coloration at the tip, the venation of which is opener, slightly, than in other specimens examined; pterostigma shorter."

Of small size: Hind wing, ♂ ♀, 26 mm.; length of abdomen, ♂, 23½ mm.; ♀, 22 mm.; anq. fore wing, 8½; part of discoidal field with

only two cells. The hamules of the 2nd abdominal segment agree with those of *C. erythraea*. These specimens seem to belong to the same form as the somewhat smaller ones recorded by Ris from Kashgar, the measurements given by him being: ♂, hind wing, 24 mm.; abdomen, 21 mm.; ♀, hind wing, 25 mm.; abdomen, 21 mm.; anq. 8½; and in a majority of examples for a short distance only two rows of discoidal cells, in some already only two cells at the triangle.

I have before me a ♂ from Quetta (hind wing 27, abdomen 23 mm.), and 2 ♂♂ (hind wing 26–27, abdomen 22–24 mm.), and 1 ♀ (hind wing 26½, abdomen 22 mm.) from Kerki, Bokhara, all of which are referable to the same form, all agree in having 8½ anq. and all excepting the ♀ have part of the discoidal field with only two rows of cells. The hamules appear also to be those of *C. erythræa*, differing from the less pointed hamules of those examples referred to below as *C. servilia*. De Selys agreed that this point of distinction between *C. erythræa* and *C. servilia* was right, but it is to be noted that his statement was made in connection with the large Japanese form in which I am inclined to think the hamules are sometimes suggestive of those of *C. erythræa*, but the difference in this respect is very slight. In the younger phases of this striking Japanese form the shoulder-stripes, judging from a few specimens before me, are hardly noticeable, and the wings are entirely suffused with a yellow tint.

13.—*Crocothemis servilia* Drury.

A long series of both sexes, October 29th–November 12th, 1917; April 5th–June 29th; August 17th–September 11th, 1918, all Amara; 1 ♀, Jebel Hamrin, N.E. of Baghdad, November 20th, 1918; 1 ♀ December 20th, 1 ♂ December 31st, 1918, Kizil Robat nearer the Persian frontier (*Evans*); 2 ♀♀, Qurnah, River Tigris, May 17th, 1918 (*Buxton*); Basrah, October 10th–14th, 1918, 2 ♂♂; October 22nd, 1 ♀; Long Island, R. Tigris, November 1st, 1918, 2 ♀♀ (*Barraud*). Received later: 1 ♀, Basrah, October 10th, 2 ♀♀, Long Island, November 1st, 1918 (*Barraud*).

Captain Evans states that this dragon-fly was fairly common when he arrived at Amara in the end of October 1917, and it increased in abundance till the cold weather in December, and the rains which commenced in that year on the 12th of that month put a stop to his rambles. It was found chiefly about gardens, but might be seen anywhere, a favourite situation being among long grass (two to four feet) beside irrigation ditches just on the outskirts of the palm groves. He writes: "On one occasion in the evening, I passed through about

four acres of such land just below Amara and put up batches of eight or ten or even more from each tuft of grass I walked through. I could see twenty or thirty easily in the air at once and there must have been many hundreds in the few acres in question."

The following additional extracts from Captain Evans's notes dealing mainly with the phases of colour in this species may be worth quoting:—

20.iv.1918: "This spring I have only seen three examples."

3.v.1918: Describing a dragon-fly hunt in flooded ground at Amara just a quarter of a mile beyond the town on May 2nd, he says of this species: "Occurs sparingly (comparatively), some being pale in colour (chiefly females), others quite red."

5.v.1918: "Still not abundant only occasional specimens met with singly; the females continue to be of a buff yellow tint, but the males are redder, some quite deep red. The pale stripe on the shoulders is constant."

27.v.1918: "Now very common. Males mostly bright red now, females equally bright yellow with just a tinge of greenish. A few females are still found of ochre colour and these, judging by the worn wings, are old specimens."

5.ix.1918: "Still frequent and in most localities. The majority are bright coloured, the males deep red, the females more or less yellow. Recently a few of the dull coloured, presumably teneral state, have appeared, all females, so far as I have examined them. Can this mean that there is a spring and an autumn brood?"

5.x.1918: "During the last week or ten days, while collecting all over the place, I have seen only one (not very) red *Crocothemis*, the quite numerous other examples noted being all of the ochreous tint sent last autumn."

The following notes are from the dried specimens:—

At the end of October and in November 1917 rather smaller specimens occurred at Amara, somewhat buff-coloured, the thorax dorsally browner so that the pale whitish or yellowish interalar line and shoulder-stripes are in strong contrast, wings with only little trace of yellow at the base, wing tips very slightly darkened, pterostigma yellowish to reddish; abdomen with a distinctly marked dorsal line in both sexes and faintly flushed with red in the male which has also the face faintly tinged with red. It seems pretty certain that these would never attain the full coloration of the summer condition.

In April larger examples appeared with wing tips more distinctly darkened, wings tinged with yellowish in the costal and subcostal fields, basal patch more noticeable and abdomen more inclined to reddish. By May the males had become much finer and redder, the face red, the basal patch of hind wings large and darker, extending to the triangle or nearly so in both sexes; in most of the examples the shoulder-stripes

continue to be well marked. In September, along with others bearing the summer livery, pale examples again appeared. Females from Jebel Hamrin and Kizil Robat, dated November 20th and December 20th, are of rather dingy colour but have still distinct shoulder-stripes. A male from the latter locality on December 31st is very similar to the autumnal males of 1917. Of two males from Basrah, one, October 10th, 1918, may be regarded as of the summer condition noted above; the other, October 14th, is less mature and in some respects approaches the Amara autumnal examples, although the basal patch of the hind wing is large and distinct, and the wing tips rather more extensively darkened; the females (Basrah and Long Island) are also more dingy, but this may be to some extent a matter of preservation. [The three females received later from the same source are of the autumnal form, that of October 10th being subteneral.]

I have no hesitation in including these Mesopotamian examples with the *C. servilia* group of forms, and I note that Mr. Campion has forwarded the Basrah specimens under the same name. They no doubt find their proper place next to the Indian *C. servilia*, and the summer examples come sufficiently near examples before me from Pusa, Bengal, and Deesa, which again agree fairly well with Rambur's description of *C. soror*, although it is not to be implied from this that I regard these examples as transition forms towards *C. erythraea*, that being Dr. Ris's view of the status of *C. soror* after an examination of Rambur's type.

Amara specimens measure :

♂ ,	hind wing	27–31,	abdomen	23–26 mm.
♀ ,	"	28–31,	"	22–25 "
Anq. 9½–10½.				

The autumnal specimens usually the smaller.

In the Indian examples which I have examined the anq. are normally 10½–11½.

14.—*Diplacodes lefebvrei* Ramb.

5 ♂ ♂ & 2 ♀ ♀, September 5th–10th, Amara; 1 ♂, 1 ♀, November 23rd, 1918, Jebel Hamrin (*Evans*); 1 ♂, October 22nd, 1918, Basrah (*Barraud*).

Does not appear to have been noticed before September, although on the 5th of that month some males were already quite black, while others on the 10th still show the markings sharply. The late examples are fully mature.

Evans remarks (5.ix.1918) : "This insect does not sit in the same perky position as *Selysiothemis nigra* with the abdomen turned up at an angle of almost 45° to the plane of the wings. The three seen to-day sat low down near the ground, the abdomen not being elevated at all."

With the exception of the male from Jebel Hamrin, all the above specimens are of rather small size, the length of the hind wings being only about 19–20 mm. Ris lays stress on size in comparing this species with *D. nebulosa*, but the measurements just quoted are hardly in excess of those of the latter species. Structural differences between the two are not clear, and there remains only the well-defined dark wing apex of *D. nebulosa* contrasted with the diffuse clouding and that not always present in the mature male of *D. lefebvrei*.

15.—*Sympetrum decoloratum* Selys.

A series (♂ ♂ and ♀ ♀) from Amara, November 8th–24th, 1917, and May 2nd–6th, June 4th, and October 19th, 1918; also ♂ ♂ and ♀ ♀ Jebel Hamrin, November 17th–22nd, 1918 (Evans); 1 ♂ Qurnah, May 17th, 1918 (Buxton); ♂ ♂ and ♀ ♀ Basrah, October 22nd, November 1st–25th, 1918 (Barraud).

First observed by Captain Evans on November 7th in an open space in a palm garden on the Masharra Canal close to Amara. They were sunning themselves on the leaves of the date palms and were lively and difficult to catch. The males were, when seen at a distance, red on the dorsal surface and easily distinguished, when resting, by this. During the following few weeks stray specimens were seen in other palm gardens, but the numbers observed (probably several hundreds) together at their first appearance were never again met with that season. With regard to the spring emergence, Evans (5.v.1918) writes: "The weather suddenly became much hotter on May 2nd. This species and *Orthetrum sabina* and *O. trinacria* appeared together on that day. Both ♂ and ♀ are, when alive, yellowish in colour; the ♂ rather more deep in colour than the ♀, which tends to have a greenish tinge. The sexes can usually be distinguished even on the wing in this way, and are about in equal numbers; though on the day they were first seen they were for the most part separated, the females being mostly in a different locality from the males. Yesterday I was in the fields lying between the palm gardens and the flooded margin of the Masharra Canal, forming an irrigated strip about 50 to 100 yards wide—just as the sun set. Suddenly, as the direct rays ceased, there arose from the vegetation a cloud of this dragon-

fly as numerous as midges in a swarm appear, or like the flakes of snow in a snowstorm. Seen against the dark palm trees the effect was a sight never to be forgotten. During the day the individuals, which are rather soft and flimsy, rest among the grass and willows and other bushes. To-day, while coming through a small clump of willows at dusk in the same locality, it suddenly struck me that some idea of the enormous numbers of these insects might be conveyed by the number which could be netted in the air at one sweep. I was surrounded with branches, but took one sweep from right to left at about four feet from the ground and covering a space of about two yards only, owing to the bushes. When I came to count the contents of the net I was surprised—there were 26 specimens in it! They were about equally numerous all round for several hundred yards in all directions. Words fail to convey the effect." 6.v.1918: "I checked the number caught at one sweep of the net by taking and counting four sweeps to-day by the Tigris, five miles down-stream. The counts were 10, 11, 12, 19. As my net had five holes, each as large as or larger than a five-shilling piece, and the bottom was knotted to hold it together at all, it is likely as many escaped as were counted. This dragon-fly is equally abundant wherever one goes, in gardens and by the river. It is a pest, as its swarms distract the eye from any other moving insect."

Barraud also refers to the red colour of the males taken by him at Basrah in October and November.

The examples from Amara in May are more or less teneral, and there is nothing in the material or notes to show what happens in the life of the species until more mature individuals appear in October and November.

Ris (Coll. Zool. Selys, p. 629) notes variation in the *valvula vulvae* of the female from certain localities. Barteneff (Faune de la Russie, Insect. Pseudoneuropteres, vol. i, livr. 1, p. 317) treats Ris's species as a form of *S. vulgatum* under the name of *vulgatum-flavum*, reserving the name *decoloratum* for a form of *striolatum*. In reviewing my own small material I am inclined to think that there may be two decolorate forms included, the more robust looking from Van being very likely a form of *vulgatum*, while others from Quetta and the Caucasus resemble those from Mesopotamia now under consideration. Similarly it may be suggested that the ♀ figured from Amasia in Coll. Zool. Selys, p. 630, is not the same as the ♂ from the Malatia, the latter being the true Mesopotamian form, while the ♀ may be *vulgatum-flavum* the same as the examples from Van.

16.—*Sympetrum striolatum* Charp.

2 ♀ ♀ November 23rd, 1918, Jeb-el-Hamrin, near Ruz, slope of dry watercourse (*Evans*).

17.—*Sympetrum fonscolombii* Selys.

A small series of both sexes from Amara, June 5th, August 27th, August 29th, and September 10th, 1918 (*Evans*). A ♂ 5.vii. and ♀ 27.viii. are both rather immature and have a large saffron patch in hind wing reaching into the triangle and up to the triangle respectively. The other examples more mature, the face and abdomen of the males becoming red and the basal patch in hind wing of both sexes much reduced.

No special notes accompany the examples of this species, but Evans, writing on September 10th, makes this remark: "Evidently a late summer and autumn insect."

18.—*Brachythemis fuscopalliata* Selys.

A series of both sexes from Amara, April 7th to May 18th, 1918 (*Evans*); ♂ ♂, April 10th–May 1st, Amara; ♂ ♀, Qurnah, River Tigris, May 17th, 1918 (*Buxton*).

Evans writes, 20.iv.1918: "This species is not as yet common. I saw one example hovering over one of the waterways at Basrah (*Magil*) last autumn (on October 20th). On 7.iv.1918, a single ♂ was brought to me by one of my men from the banks of the Tigris about four miles down-stream. I have seen (on 9th and 10th) four more there but could catch none."—3.v.1918: Describing a dragon-fly hunt near Amara on May 2nd: "Scores of the graceful *Brachythemis*, the males alone with their black patched wings, and rather fewer of the more difficult to detect females."—5.v.1918: "Now very abundant in several localities. On the Masharra Canal as many as four males may frequently be seen on one small tuft of grass rising above the water. The females are equally abundant. Males with almost unmarked wings occur."—5.x.1918: "The only one noticed in the autumn of 1918 was a ♀ (apparently), near Amara on October 1st."

Reported to be fond of sitting on willow twigs overhanging the water usually. The wings are outspread, but slightly tilted above the horizontal. The black patches show up wonderfully and the poise of the creature is suggestive of haughtiness. A wire fence in a palm garden by the Tigris was also a favourite settling place; others were taken by the side of a pool in a garden by the Masharra, and by pools and

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Photo, W. E. Evans.
LARGE MARSH 12 MILES BELOW AMARA.



Photo, E. Vuill.
HABITAT OF SELYSIOTHEMIS NIGRA RIGHT BANK OF TIGRIS ABOVE AMARA.

ditches in fields near Chahala below Amara. An interesting capture was a mature ♀ at light in Captain Evans's room at Amara on May 18th.

Ris (Coll. Zool. Selys, p. 585) says that in *B. leucosticta* the dark postnodal band seems to be wanting in the quite freshly developed ♂; it appears at first as of less extent and as a clear greyish brown cloud, and only attains its definite extent and full colours gradually. It is not altogether clear from the material in hand that the ♂ of *B. fuscopalliata* passes through precisely the same phases, as in a comparatively teneral condition the dark patches are present although not sharply defined nor highly coloured. Our material is also not quite convincing that males occur with almost unmarked wings, although one male which appears to be fairly mature shows mere indications of the

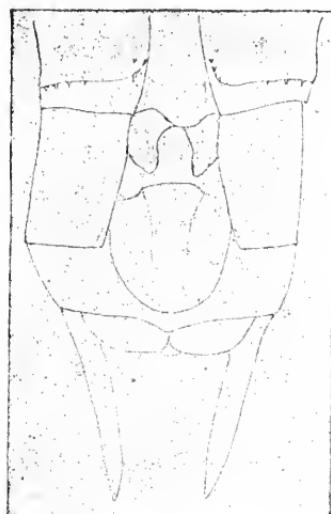


Fig. 3.—*Brachythemis fuscopalliata*. Apex of abdomen of ♀ seen from beneath.

darker patches in the shape of a faint yellowish suffusion out of which the dark venation stands prominent.

The females much resemble the young males in colour of the body; front and vertex greenish with a blackish line in front of the ocelli; labium and back of the head yellowish. Thorax olivaceous with rather indistinct median lines, and with forked ante-humeral lines, the outer branch of the fork about half the length of the inner; lateral sutures narrowly black and vague traces of other dark markings; legs pale lined with black, the lines on posterior femora and tibiae on the inner side

sometimes partly broken up into linear dots. Wings entirely hyaline, venation pale to the nodus and areulus. Abdomen above with blackish median and lateral lines, the lateral varying much in breadth and sometimes interrupted at the distal end of the segments up to the 8th; segments 9, 10 black above. None of the females shows any trace of dark patches on the wings; in *B. leucosticta* females exist with dark banded, as well as others with hyaline wings.

19.—*Trithemis annulata* Beauvais.

1 ♂, October 14th, 1918, Basrah (*Barraud*): immature.

The British Museum possesses a series from Muscat, so its occurrence at Basrah is hardly a surprise.

20.—*Trithemis festiva* Rambur.

1 ♀, November 29th, 1918: Dry watercourses, Jebel Hamrin (*Evans*).

21.—*Selysiothemis nigra* Lind.

A long series of both sexes from Amara April 10th to April 28th, May 4th, June 29th, August 26th, and September 6th to 27th (*Evans*); April 9th, 10th, and 28th, Amara, and May 17th, 1918, Qurnah (*Buxton*).

Immature specimens to the end of April, but even as early as the 10th of that month, some of the males had begun to take on their dark coloration. Fully mature specimens in May and June. In August and September immature examples again appeared.

There would thus appear to be two broods, or two separate periods of emergence, in the year, the examples taken in the second being of smaller size than in the earlier.

April—May: Length of fore wing, ♂ 27–28, ♀ 27½; abdomen, 22 mm.

September: Length of fore wing, ♂ 23, ♀ 22½; abdomen, ♂ 19, ♀ 17 mm.

Captain Evans writes: "On April 11th, 1918, I visited some fields of young grain just outside the perimeter wire and saw hovering about the barley patches large numbers of this species, these being practically the first observed. Since then they have been very numerous everywhere, especially about open cultivated ground, where they rest on grass stems, flower heads (especially *Carduus Marianus* and a species of *Cnicus* resembling *pycnocephalus*), etc. They are easily caught, not being very vigorous on the wing, and not flying far or fast.—5.v.1918: "Still abundant, but numbers slightly reduced, the males frequently darker in

colour. May be found by the water-side, but prefers open fields and drier places. Sexes equally abundant."

24.ix.18 : A few remarks on the numbers of *Selysiothemis nigra* seen by me on September 17th on the desert land about four miles down the railway from Amara may be of sufficient interest to warrant my detailing them. The ground for miles at the locality in question, which is some distance from the river, is perfectly flat, baked hard by the sun, and quite uncultivated but traversed by numerous deep irrigation-channels with steep sides about four feet deep, along the margins of which large ridges are formed by the excavated mud. At present these channels, which run at right angles to the river at intervals of from 100 to 400 yards, are quite dry; they carry water earlier in the year to the barley-growing land some distance farther from the river. The parched ground is here sparsely clad with desert vegetation—an annual and a perennial *Suaeda*, a very mealy dry *Atriplex*, a few stunted Tamarisks along the channel margins, and a *Salsola*; with a fair amount of acacia scrub and camel thorn, are all there is for miles. The ground has no crust of salt showing on the surface, nor is there any seen on the dry walls of the channels. I observed great numbers of the *Selysiothemis* all along the railway, on the embankment of which I was somewhat precariously motor-cycling. I therefore halted, and from where I was, endeavoured to estimate their numbers. I noted that the dragon-flies were resting on the telegraph-wires, as a flight of birds often does, sunning themselves with raised abdomens as is their wont. It was very difficult to count them against the glaring sky, but I easily made out thirty-six on one wire between one post and the next—there were almost certainly more. For the sake of my eyes I merely glanced at the three remaining wires to assure myself that there were about an equal number on these also; and at adjoining lengths of wire, with the same result. It is therefore certain that at least 140 of these insects (I saw no other kind) were perched between each telegraph-post and the next for miles. In addition they were to be seen in numbers resting on any tallish branch of the vegetation within view."

This peculiar insect is, as Ris states (Coll. Selys, p. 1042), one of the most remarkable objects of the European dragon-fly fauna. Recorded from southern Italy in 1825 and Catalonia in 1878, it remained unknown otherwise until Ris described a series from Kashgar Darja in 1897. Since then Bartenev has recorded it from Anru Darja, Turkestan, Bokhara, Persia, Afghanistan, the Caucasus; also Ris from the Algerian Sahara; and more recently Campion ("Entomologist," vol. li, p. 128,

1918) reported its capture in Macedonia by Waterston. Although therefore the mystery that surrounded the species so long has now been dispelled, the record of its occurrence in Mesopotamia, where it appears to be so much at home, forms an interesting addition to what is already known about its distribution.

The lower illustration on Plate V shows the nature of the habitat of *S. nigra*.

13 Blackford Road, Edinburgh.

April 1919.

POSTSCRIPT.—Since the foregoing was written, Captain Evans has forwarded additional material taken by him at Basrah, on his way home, bringing up his captures to over 400 specimens. Included are the two species of *Ischnura*, *A. parthenope*, *O. sabina*, *O. trinacria* (April 1st), two species of *Crocothemis*, *D. lesebrei* (March 27th–April 1st), and *T. annulata* (a fine series, March 26th–29th). The additional examples of the small *Crocothemis* call for further examination, and may prove to be a race of *C. erythraea* worthy of a distinctive name on account of their peculiar neuration, which is apparently darker, and other characters. It should be noted that in *I. evansi* when the 8th segment is fully visible there is a narrow black line on the anterior margin and traces of a finer line on the posterior margin.

ON THE CAPTURE IN FRANCE OF SEVERAL RECENTLY DESCRIBED BRITISH COLEOPTERA.

BY COLONEL J. SAINTE-CLAIRE DEVILLE.

During the last fifteen years I have paid special attention to the numerous descriptions of new British beetles, mainly published in the "Entomologist's Monthly Magazine." As our French fauna has a close relationship with that of Britain, my own material has been revised from time to time, and I have often succeeded in finding examples agreeing with the descriptions, or identical with co-types which have been sent to me for examination.

Owing to my occupation with war duties for nearly five years, the notes are incomplete as to recent work, but I think it desirable to give this provisional list of Continental records and observations about these British insects.

Tachys walkerianus Sharp.—This species does not require discussion. I took it freely in April 1886, on sandy paths of the "Forêt de

Châteauroux," Indre; it is not uncommon in similar situations in the well-known Forêt de Fontainebleau.

Bradyceillus sharpi Joy.—Seems to be widely distributed in northern and western France. I took it at Yport, Seine-Inférieure, and in the "Forêt de Boulogne"; M. Degors has sent me specimens from Bouquelon, Eure; and I have also seen it from the following localities: Marly, Seine-et-Oise (*Ch. Brisout*); L'Home, Orne (*Bedel*); several localities in the neighbourhood of Nantes (*Ed. de l'Isle*).—A very distinct species.

Olophrum nicholsoni Donisth.—The French specimens of *fuscum* Grav., which I recorded twelve years ago from the vicinity of Soissons ('Faune du Bassin de la Seine,' ii. p. 44) are really *O. nicholsoni*. I have no French record of the true *fuscum*.

Bledius secerdendus Joy (? *subniger* O. Schneid.).—I have taken exclusively typical specimens of *secerdendus* in Western Brittany, especially near Roscoff and Begmeil, Finistère. But amongst numerous series from Northern Germany, Belgium, and Northern France, I am unable to separate it satisfactorily from *arenarius*, the two insects occurring together with intermediate forms; the characters given seem to vary by degrees and to become insensibly evanescent. On the coast near Le Croisic, Loire-Inférieure, I was surprised to find again unmixed and very typical *arenarius*. At St.-Gilles-sur-Vie, Vendée, the species is absent and replaced by its allied *B. tristis* Aubé.

GABRIUS Steph.—I have worked specially on this genus, according to the directions given by Dr. Sharp and Dr. Joy, and have succeeded in finding in France seven of the eight species mentioned by the British authors (incl. *nigritulus* Grav. and *trossulus* Nordm.); only *G. bishopi* has hitherto escaped me.

G. trossulus Nordm. seems to occur specially on peaty ground; I have taken it at Pontarlier, in several localities in the Dept. Aisne, and in the extensive marshes south from Etaples, Pas-de-Calais.

G. nigritulus (sensu Sharp).—Extremely common everywhere in France.

G. stipes Sharp.—Ambleteuse, Pas-de-Calais; a single ♂.

G. velox Sharp (= *primigenius* Joy).—Not very rare, especially in flood refuse; taken at Gudmont, Haute-Marne, at Toul, Meurthe-et-Moselle and near Folembray, Aisne. I have received it from the Island of Sylt, Northern Germany.

G. pennatus Sharp.—Generally distributed and rather abundant throughout France, chiefly on sandy banks of rivers and in flood refuse.

G. keysianus Sharp.—Sandy shore near Ambleteuse, Pas-de-Calais; three specimens, ♂ ♀.

G. appendiculatus Sharp.—I have taken this species in the wet moss of a small alpine lake, near St. Etienne-de-Tinée, Alpes-Maritimes, at about 8000 ft. elevation.

In the present genus I have always found the form of the penis absolutely constant and to conform strictly to Dr. Sharp's descriptions.

Quedius subapicalis Joy.—I have not yet seen any specimen of this species from France, but it occurs in the mountains of Corsica and Algeria.

Q. hummianus Sharp.—This *Quedius* is a well-known one on the Continent, where it has a southern and western range; it is, of course, chiefly a coast insect. It has been described previously under the names of: *pallipes* Lucas, from Algeria; *simplicifrons* Fairm., from Corsica; and *hispanicus* Bernh., from Spain. I have taken it in Brittany (Roseff, Le Croisic) and on the Mediterranean shore (Antibes, St. Raphaël). Whether it is really a distinct species or a southern and macropterous form of *molochinus* I am not able to decide. In any case it must take the name of *pallipes* Luc.

Gyrophaena convexicollis Joy.—Among hundreds of *G. lucidula* Er., occurring in fungi on old stumps of willow and poplar at Vitry-le-François, Marne, I have detected four specimens of this very distinct species.

Myrmecopora brevipes Butl.—I have taken this species in some numbers under seaweed in Jersey (beneath Gorey Castle), at Begmeil, Finistère, and Le Croisic, Loire-Inférieure. The true *M. uvida* Er. does not occur in France north of the Islands of Ré and Oléron.

Hydraena britteni Joy.—Besides the specimens taken in the neighbourhood of Arleuf, Nièvre, and already recorded by Dr. Joy, I have succeeded in finding numerous examples near Epinal, Vosges, among dead leaves at the bottom of a ditch of fresh and somewhat current water.

Laccobius purpurascens Newb.—This beautiful small Hydrophilid has been met with only in the neighbourhood of Castres, Tarn, by M. Galibert, who has recently recorded the precise location of his captures (Bull. Soc. Ent. Fr. 1916, p. 270). One of the spots is on red sandstone, as in Devon.

Laccobius ytenensis Sharp.—Generally distributed and common throughout Northern and Central France; further, in Northern

Spain (*Paganetti-Hummel*); recently recorded from Belgium by M. d'Orchymont.

Cercyon (Cercyon) sternalis Sharp.—I have, under the name “*subsulcatus* Rey,” numerous specimens of a little *Cercyon* which agrees with Dr. Sharp's description; it lives in marshy places in various localities, from Douai and Boulogne to Hyères and Antibes. I presume that *Cercyon sternalis* Sharp is synonymous with *C. subsulcatus* Rey; but as Dr. Sharp does not allude to the last-named species, a direct comparison would be necessary for elucidation.

Dryops anglicanus Edw. (Sharp, Ent. Mo. Mag. 1919, p. 78).—As was foreseen by Dr. Sharp, this very distinct species occurs in Northern France. I have taken half-a-dozen specimens in the extensive marshes near St. Josse (south from Etaples, Pas-de-Calais).

Cryptophagus fowleri Joy.—Dr. Joy has recognized his species in one specimen I took many years ago in the “Forêt de Haute-Sère,” near Fourgères, Ille-et-Vilaine.

Enicmus histrio Joy.—This Lathridiid seems to be much rarer in France than in Britain. Although my attention was called to it, I have during the War taken only one specimen, and that was found in the neighbourhood of Folembray, Aisne.

Gnathoncus nidicola Joy.—I have an old specimen, captured by myself in the “Forêt de Séhart,” twenty miles south-east from Paris, in September 1885. It was taken recently in some numbers by M. du Buysson at Brût-Vernet, Allier, chiefly in old birds' nests. Dr. Auzat has recently described from the same locality a fourth species, *G. buyssoni* (Bull. Soc. Ent. Fr. 1917, p. 184), that I have not yet seen.

Cantharis darciniana Sharp.—Recorded some years ago from the Belgian coast by the late M. Bourgeois (Ann. Soc. Ent. Fr. 1886, Bull. p. exli). I have seen a nice series, ♂ ♀, from the Isle of Sylt, Northern Germany, taken by Mr. C. Stock.

Anaspis garneyi Fowl.—Not uncommon on hawthorn blossoms in May and June around Boulogne-sur-Mer. I have bred it from old timber (elm and poplar) of my own garden. Further, I captured formerly one specimen in the Alpes-Maritimes at about 3000 ft. elevation, and saw another from Compiègne, in M. Bedel's collection.

Galerucella fergussoni Fowl.—On three different occasions I have captured specimens of a *Galerucella* feeding on *Comarum palustre* L.: June 1911, in peat mosses near Pontarlier; August 1912, on the banks

of the Lake of Retournemer, Vosges; August 1918, at Hardelot, Pas-de-Calais. At Retournemer larvae were in plenty on the leaves of *Comarum*, with imagines. Among hundreds of specimens there is a certain proportion of small and very dark ones, quite identical with my Scotch example of *fergussoni*; but, on the whole, size and colour seem to be extremely variable. It seems probable that the *Galerucella* of *Comarum* is a distinct species from that found on *Nymphaea*, but I am not quite sure that it is really separable from *G. sagittariae* Gyll. I may state here that many *Galerucinae* present in their ethology a curious instability, various species of the same genus, even various races of the same species, feeding on very different plants. An interesting contribution to these facts has been recently published by my friend P. de Peyerimhoff: it is the natural history of *Galeruca violacea*, an Algerian beetle feeding equally on *Pulicaria* and *Rumex* (cf. Ann. Soc. Ent. Fr. 1915, p. 34). Analogous observations are reported on certain species of the genera *Bromius* and *Graptodera*.

Barypithes duplicatus Keys.—This species and *B. pellucidus* have in France separated areas, and they do not occur together. *B. duplicatus* has a marked western range: I know it from Mortain, Manche; Rennes; Morlaix and Brest, Finistère; Guérande, Loire-Inférieure, and Limoges. At Boulogne-sur-Mer and in the vicinity of Niort I have found only *pellucidus*, which, of course, is a very common beetle in Northern and Eastern France, extending to Western Germany.

Anthonomus rubi, v. *comuri* Crotch.—I took a specimen of this curious small weevil at Hardelot, Pas-de-Calais, where it probably feeds, as in England, on *Comarum palustre* L.

St. Léonard par Pont-de-Briques (Pas-de-Calais).

July 1919.

SOME NOTES ON *CETONIA AURATA*.

BY K. G. BLAIR, B.Sc., F.E.S.

During the month of July the handsome Rose Chafer (*Cetonia aurata* L.) was very abundant on the island of St. Mary's, Scilly, though strangely enough its distribution appeared to be practically limited to the immediate coast on the eastern side of the island. Here the insect was in numbers, during the early part of the month upon the flower-heads of thrift, but when this began to get over it preferred the flowers of the wild carrot and bramble. Occasionally a Chafer would fly past in the sunshine, but for the most part they were engrossed in

feeding, and did not often take flight. They would, however, readily do so when picked off a flower. It was observed that in flight they do not open the wing-cases, but keep them closed on the back, the wings being put out through the emargination of the sides of the elytra. When taking flight the elytra are raised a little above the abdomen to allow more ready egress to the wings, but without opening at the suture, so that the operation is accomplished with remarkable suddenness.

Considerable variation in size and colour was observed, some individuals being perfectly green, others of a coppery-golden tint, these differences being quite irrespective of sex. Three specimens were found of a shining black colour, faintly tinged with bronze. This is apparently the var. *nigra* Gaut. of the European list, but the form does not appear to have been hitherto noticed in the British Isles.* These three specimens are females, and they were all taken off thrift on the same headland, two of them on one day and one a few days later. Further search failed to discover any more, though the normal form was plentiful enough.

One example noted, though unfortunately it flew away while under observation, was remarkably hairy. This, I imagine, must have been a freshly emerged individual that had either passed the winter in its cocoon before escaping from it, or hibernated as a full-grown larva. It is not, however, the case that all freshly emerged specimens are more strongly pilose. Those now emerging from cocoons obtained in Scilly are not abnormally hairy.

During the early part of the month it was noticed that the sexes were about evenly represented; but later males appeared to become scarcer. On July 24th 22 specimens were collected from a small bramble-bush, all females but one. Only one pair was observed *in cop.* during the whole time. Whether these females had oviposited or not was unfortunately not ascertained.

On the same date a breeding colony was discovered under some granite boulders partly overgrown with grass and thrift, the boulders being piled together on an open tract of grassy ground close to the sea. On turning over one of them, the earth beneath was found to be loose and friable, containing many loose fragments of granite, and largely composed of the pellets of excrement discharged by *Cetonia* larvae. In rummaging amongst this loose material some young larvae were first found, apparently not long hatched, and later a number of full-grown larvae and cocoons, some of which contained the white, rather flaccid larvae awaiting pupation, others containing the honey-yellow pupae. Turning over other adjacent stones showed that these conditions

* I have taken this and various other forms in the same locality at Vizzavona, Corsica.—G. C. C.

extended over an area of some yards, though other stones revealed only ants' nests, of three different species*, with not a trace of *Cetonia*. Numbers of ants were found in the friable earth with the *Cetonia*, but the larvae could not be said to be in the nests. Subsequently, further colonies of the *Cetonia* were found, in each case under boulders, and usually with the ants also present. The larvae of *Lacon murinus* were also to be seen in considerable numbers, and they were probably preying upon the young *Cetonia* larvae.

These notes obviously refer to quite different conditions from those described by Mr. Hamm † and Mr. Donisthorpe ‡. These Scilly larvae were certainly not feeding in rotten wood, but probably upon the roots of the thrift and grass, or upon the dead vegetation that accumulates in such situations. *Formica rufa* was not present, and though there were the other ants mentioned, the beetle larvae were not in the nests and the association *may* not have been more than accidental. (It is also mentioned, be it noted, by Curtis, "Farm Insects," p. 108, but so accurate an observer as Fabre does not allude to ants in connection with *Cetonia*. According to this observer the beetle oviposited and the larvae fed in heaps of rotten leaves.) The Scilly colony bore every appearance of being a permanent one, containing successive broods year after year; at any rate, evidence of three different broods was found when the nest was examined, viz., young larvae (*probably* from eggs laid this year); full-grown larvae and pupae (no intermediate stages); empty, vacated cocoons and fragments of dead beetles (*i.e.* of the brood now in evidence that matured last summer).

These observations, together with the accounts previously published of this insect, seem to indicate that the life-history of the Rose Chafer is somewhat as follows:—

First year.—Eggs laid in early summer hatch and the larvae hibernate fairly young.

Second year.—Larvae attain maturity, pupate, and beetles emerge in August, though sometimes perhaps not leaving the cocoon until the following spring. It may be that two years or more are spent by the larvae before attaining maturity, but no evidence of intermediate stages was discovered in the colonies observed by me. Mr. Hamm has shown that some apparently fully-fed larvae in a brood may pass through another winter before pupating, but the imagines from these will be out with those that have hibernated as beetles.

* *Myrmica scabrinodis* Nyl., *Tetramorium caespitum* L., and *Lasius flavus* Fab.

† Ent. Mo. Mag. 1910, p. 137.

‡ Ent. Record, 1904, p. 301.

Third year.—After hibernation, according to Fabre, pairing takes place, and the eggs are laid in June. The fact of my finding young larvae towards the end of July is quite in agreement with this statement; but there is some doubt whether oviposition always takes place so soon after pairing, or whether another year does not elapse between these two acts. The isolated act of pairing observed by me as related above may merely have been very belated, but other specimens kept in captivity by Mr. Hugh Main were found pairing freely in August, thus suggesting that the female may have to pass through another winter before laying her eggs. This is a point that Mr. Main hopes to settle shortly.

British Museum (Nat. Hist.), S.W. 7.

August 20th, 1919.

**LASIACANTHA CAPUCINA GERM. A TINGID BUG NEW TO THE
BRITISH LIST.**

BY E. A. BUTLER, B.A., B.Sc., F.E.S.

Mr. J. H. Keys is the fortunate discoverer of this interesting addition to the list of British Hemiptera. In June last he obtained about a score of specimens on the cliffs at the Lizard, Cornwall, and they occurred on the known food-plant, wild thyme. Mr. Keys says: "The insects were taken off thyme, by 'brushing' with my hand plants growing by a pathway; by this method the insects were knocked into the path and then collected; they were not abundant, at most three or four examples in a cluster of the plant." Two specimens also were taken at the roots of plants on a big boulder about a mile away across the Downs.

Lasiacantha was erected by Stål in 1873, as a sub-genus of *Tingis*; the next year he made it of generic value. By some later authors it has been merged in *Monanthia* (*s. latiss.*), but it is now generally regarded as a good genus, of which four Palaearctic species are known. The genus has not hitherto been represented in our British fauna; it belongs to that section of the *Tingididae* which has the rostral channel formed by the bucculae closed in front. It may be distinguished by having the lateral margins of pronotum and hemelytra furnished with setigerous denticles. *L. capucina* is dimorphous, having both macropterous and brachypterous forms, the latter of which appears to be far the commoner, and to it all the specimens taken by Mr. Keys belong. The macropterous form is of the elongate shape which we are familiar with in

Monanthisia, but the brachypterous has the oval outline which such a condition usually produces and with which we are familiar in *Acalypta*. A specimen in the British Museum is intermediate between these.

L. capucina Germ.

Head black, with five forwardly directed straight ochreous spines; pronotum black, with anterior vesicle, three discal carinae, and raised side margins, ochreous, the latter with setigerous denticles which are often indistinct, so that it appears to be merely ciliated; hemelytra ochreous, discoidal area with 4-5 series of meshes at the widest part, costal area with two rows of meshes, the dividing lines of the outer row black, lateral margins with distinct setigerous denticles; whole of upper surface strongly pilose, hairs curved at the end; antennae with first two joints brown, third ochreous, fourth black, third about $2\frac{1}{2}$ times as long as fourth; femora brown, tibiae and tarsi ochreous, claws black; underside black.

Length, brachypt. $2\frac{1}{4}$ - $2\frac{1}{2}$ mm.; macropt. $2\frac{2}{3}$ -3 mm.

The species has been recorded from France, Germany, Switzerland, Italy, Austria, Hungary, Serbia, Rumania, S. Russia, and the Caucasus.

Douglas & Scott, in their "British Hemiptera," include it, as *Monanthisia capucina*, amongst the "reputed" British species (p. 619), so that in their day there were apparently rumours of its occurrence in Britain, but no authentic specimens were known, and it is satisfactory, therefore, to be able now to place the species definitely on our list.

I am indebted to Mr. Keys for kindly presenting me with some of his captures.

14 Drylands Road, Hornsey, N. 8.

August 1st, 1919.

LYGAEONEMATUS WESMAELI TISCHB., A HITHERTO UNRECORDED
BRITISH SAWFLY (FROM YORKSHIRE).

BY THE REV. F. D. MORICE, M.A., F.Z.S.

In August 1917 information was received at the Pathological Laboratory, Kew Gardens, that "the larch Saw Fly" was attacking larch-trees (aged about 14 years) in woods belonging to the Arncliffe Estate in Yorkshire. Mr. Fryer asked that specimens of the larvae should be sent to him, and these were reared in the Laboratory, the imagines beginning to emerge by the end of May 1918.

It was expected that these would be examples of *Lygaeonematus laricis* Hartig; but when they were sent to me for identification, I

found that they did not belong to that species, but to another of the same genus which has not yet been recorded as British, namely *L. wesmaeli* Tischb. (= *solea* Vollenh.). Mr. Fryer has kindly given me a pair of them for my collection, and has also placed specimens in the Natural History Museum, S. Kensington.

The two species may be easily separated by differences both of coloration and structure. *L. laricis* is a very dark-bodied insect, in fact almost entirely black both above and beneath; while in both sexes of *wesmaeli* the pale yellowish underside of the body contrasts remarkably with its black dorsal surface. For this reason v. Vollenhoven called it *solea*, fancifully comparing its coloration to that of the fish so named.

In all the specimens submitted to me (3 ♂♂ and 2 ♀♀) a large black patch covers the entire ocellar and vertical areas and spreads down into the occiput, completely filling the latter, but leaving the tempora and orbits pale. The thorax (except its yellow pronotum and tegulae) and practically the whole abdomen are also black above, and there is a little oblique black streak on the mesopleura, just below the insertions of the wings. But all the rest of the body—the whole face below the antennae, the orbits, tempora, prothorax, pleura, breast, ventral surface of abdomen, etc.—is pale luteous. So, too, are the antennae and legs almost entirely, but the former are slightly clouded above (especially their basal joints), and the tarsi (except the claw-joint) and, in the ♀, the extreme apex of the tibiae are black (in the hind legs only). The wings are clear, with brightly flavous stigma and costa, and the rest of the venation pale yellowish brown.

In structure, the two species belong to different sections of the genus. *L. wesmaeli* belongs to the group containing *pini*, *saxeseni*, etc., in which the fovea on the apical dorsal segment of the ♂ abdomen is rounded rather than angular at its base, and the saw-sheath of the ♀ (viewed laterally) is sharply truncate, not rounded at the apex. It differs from the other members of that group, (*a*) by its very transverse vertical area, many times more broad than long; (*b*) by its comparatively parallel-sided ♀ abdomen, this being only very slightly compressed towards the apex; and (*c*) by the disappearance (as in *Pristiphora*) of the 1st cubital nerve. This character is very unusual in *Lygaeonematus* spp., but appears to occur regularly in specimens of *wesmaeli*.

In *L. laricis* the apical fovea on the ♂ abdomen is angled at the base, the ♀ saw-sheath is rounded at the apex, and the 1st cubital nerve is regularly present.

L. wesmaeli has hitherto only been recorded from Germany and

Holland, and even in those countries is said to occur very rarely. I have never seen a Continental specimen of it myself. Nor have I seen the larva, but it is said to differ from that of *laricis* in not having a white line on each side of the dark central dorsal stripe, or "food-canal."

Woking,
July 16th 1919.

Memorial to the late Frederick Du Cane Godman, D.C.L., F.R.S.—A Committee has been formed under the chairmanship of Lord Rothschild, F.R.S., to establish a memorial to the late Frederick Du Cane Godman, F.R.S., in acknowledgment of his lifelong devotion to the interests of natural history and in grateful testimony of the many valuable benefits conferred by him in promoting the study of natural science in this country. At a meeting of the Committee held at the Natural History Museum on the 30th April last, it was resolved that the memorial should take, primarily, the form of a bronze tablet with medallion portraits of Mr. Godman and of the late Mr. Osbert Salvin, Mr. Godman's lifelong friend and collaborator in all his scientific enterprises, and that this tablet, with a suitable inscription, should be offered to the Trustees of the British Museum, to be placed in the Natural History Museum at South Kensington. The Committee hope to be in a position to do something additional to perpetuate the memory of Mr. Godman, by helping to establish a less local form of memorial. It is the intention of Dame Alice Godman and her two daughters to found an Exploration Fund in the interests of the Natural History Museum. For this purpose they have offered to establish a Trust with the sum of £5000, the proceeds of which are to be devoted to making collections for the advancement of science and for the benefit of the Museum. This fund is to be called the "Godman Memorial Exploration Fund." Dame Alice's project has met with the warm approval of the Trustees of the British Museum. The Committee, therefore, propose that any amount received by them over and above that required for the bronze tablet shall be added to the Exploration Fund. They also hope that this may form a permanent basis for future donations and bequests for the same purpose. Mr. Godman's work is too well known to need any lengthy exposition. The "Biologia" certainly constitutes the greatest single work in natural history even planned and carried out by private individuals, and rivals such national undertakings as the "Challenger Report," which, of course, was financed by the British Government. The whole of the vast natural history collections on which the "Biologia" was based were presented by Messrs. Godman and Salvin, and (after the death of Mr. Salvin) by Mr. Godman, to the nation, unfettered by any stipulations, and these collections are now in the British Museum of Natural History. But Mr. Godman's services to science do not rest alone on the publication of his great work. The value of his gifts to the Natural History Museum, apart from the "Biologia" material, must amount to many thousands of pounds, and he was ever ready to help any undertaking for the benefit of his beloved science. An appeal to him invariably brought forth a favourable response. The Committee confidently ask for funds to carry out the

scheme outlined in this circular. Contributions should be sent to Mr. C. E. Fagan, Hon. Treasurer, Godman Memorial Fund, Natural History Museum, Cromwell Road, London, S.W. 7.—EDS.

Note on the genera Phucobius Sharp and Orthidus Rey (Staphylinidae).— Sharp in Trans. Ent. Soc. London, 1874, p. 35, founded the genus *Phucobius* for a maritime species from Japan, describing it as *simulator*. Rey in Ann. Soc. Agric. Lyon (4) viii. 1875, p. 339, founded his genus *Orthidus* on *Philonthus cibratus* Er., a species found on the Mediterranean coast in salt marshes. To *Phucobius* properly belongs *Ocypus congruus* Walk., from Ceylon, and a comparison of this insect with *Orthidus cibratus* shows that there is no structural difference whatever between this genus and Sharp's *Phucobius*, which having priority stands. So far as is known, the genus appears to be entirely maritime. There are two examples of *congruus* Walk., from Ceylon, in the Lewis Collection in the Natural History Museum, South Kensington, bearing the label "Horton Plains, 6000 feet"; but on the lower surface of the mount is written "sea-weed," and as it is not probable that sea-weed would be found at that altitude it would appear that the locality-label is incorrect.—M. CAMERON, 7 Blessington Road, Lee, S.E. 13: August 10th, 1919.

Adimonia oelandica Boh. in Dorset.—On July 25th, 1919, I captured a specimen of this interesting Galerucid flying low over the Playing Fields, Sherborne School, Sherborne, Dorset.—E. J. PEARCE, The Lodge, Corpus Christi College, Cambridge: August 5th, 1919.

Lytta vesicatoria L. in Norfolk and in the Isle of Wight.—Several living specimens of this species have been sent to the Natural History Museum by a correspondent at Feltwell, Norfolk, where they were reported to be defoliating an ash-tree. They were fed on lilac, and three or four batches of ova were obtained from them. In about a month's time the latter hatched and the young triungulins were provided with eggs and pollen-masses from the cells of *Andrena nitida* and *Halictus* spp., but this diet was not acceptable to them, and, though some lived for about a month, the attempt to rear them was not attended with any success. A single individual of the same species was taken on the wing during the present season near Sandown, I.W., by Mr. Hugh Main.—K. G. BLAIR, British Museum (Nat. Hist.), S.W. 7: August 20th, 1919.

Atheta inhabilis Kr. and A. valida Kr. in Berkshire.—I took a solitary example of *A. inhabilis* Kr. near Wellington College, from under the loose bark of a decayed pine log on June 29th. This species, which was introduced to our fauna by Dr. Joy as *Epipeda nigricans* Th. (Ent. Mo. Mag. xlv, 1909, p. 268), and subsequently (Ibid. xlvi, 1911, p. 111) corrected by him, has hitherto only been recorded from Scotland. Close by I found a female of *A. valida* Kr., kindly identified by Dr. Cameron, on June 8th, among the damp ashes of burnt pine tops.—G. W. NICHOLSON, Oxford and Cambridge Club, S.W.—July 24th, 1919.

Some Coleoptera taken in Somersetshire: a correction.—In the list under this heading in the last number of the Ent. Mo. Mag. (August 1919, p. 179)

there is unfortunately an incorrect record. Mr. E. A. Newbery drew my attention to the improbability of *Hydraena palustris* occurring in Somerset, and, on re-examination, I find the specimens so labelled to be *H. testacea* Curt. My thanks are due to him for enabling me to correct the error at once.—C. T. GIMINGHAM, Long Ashton, Bristol: August 18th, 1919.

A few Insects in the New Forest.—A hurried visit of three or four days to Lyndhurst on July 25th produced a very few interesting species; but, as a whole, insects were not numerous, and assiduous working produced far less numbers than in Suffolk at this time of year. *Limenitis sibylla* was worn but still abundant in the enclosures, with *Lycaena aegon* on the heaths at Ringwood and Matley. *Sutyrus aegeria* was as frequent as in 1895 (cf. Ent. Mo. Mag. 1895, p. 192); it is now become quite extinct in Suffolk, where I have not seen it in thirty years' collecting. In all we noted twenty-five species of butterflies. *Choerocampa elpenor* and *Bombyx rubi* larvae were rare; but imagines of *Pseudoterpnia cytisaria*, *Eubolia palumbaria*, and *Gelechia ericetella* were common among heather; and *Pyruusta purpuralis* was everywhere. The dragon-flies were represented by *Orthetrum caerulescens* and *Cordulegaster amulatus*, both rarer than in August 1901 (cf. Ent. Mo. Mag. 1903, p. 25); and the only other conspicuous Neuropteron seen was *Calopteryx virgo*. *Platycleis brachyptera* was not rare in bogs at Matley and Bratley: *Nemobius sylvestris*, whose song we at first mistook for that of *Cicadetta montana* (cf. Entom. 1911, p. 333), and *Ectobia panzeri* were common; but we saw nothing of *Mecostethus grossus*. Beetles were distinctly scarce, and I never saw so few Longicorns here; nothing but *Strangalia armata* in plenty, and one *S. nigra*. *Anomala frischii*, with green elytra, was in a sand-pit by Matley Bog, where *Sphindus dubius* occurred in a black fungus on a felled tree; *Cryptoccephalus labiatus* and both sexes of *C. pusillas* were on *Myrica* in Boldrewood; and *Gonioclema viminalis* on sallow; *Orchestes iota* was not very common on the above plant at both Boldrewood and Matley; and *Hylobius abietis* was lying under every felled pine log. The only really local Coleopteron was a single *Platypterus cylindrus* ♂, new to my collection; this was walking busily up the inside which faced west of a ten-foot high dead oak stump in the "Cicada paddock" at 11 a.m. (Greenwich time) on 26th; Fowler, v, p. 452, gives as localities Windsor, Shipley, New Forest, Monmouth, Herefordshire, and Scarborough; with no addition to these in the Supplement. Two uncommon Hemiptera were *Pilophorus perplexus* on *Myrica gale* at Boldrewood, along with numerous *Oliarus leporinus*, new to me, and recorded by Edwards only from Clifton, Lulworth, Purbeck, and Ryde; the latter was also found on the same plant at Matley Bog. *Mucroderus micropterum*, *Atractotomus mali*, *Idiocerus distinguendus*, *Pediopsis virescens*, and *Callipterus betulincola* were noted. The larger Diptera were scarce with the exception of *Tabanidae*; these attacked us with considerable éclat, and we thinned out *Haematopota pluvialis*, *Therioplectes distinguendus*, *Tabanus bovinus*, *T. bromius*, and *T. maculicornis*, *Atylotus fulvus*, *Chrysops caecutiens*; but saw neither *C. quadrata* nor *Anthrax fenestratus*, both of which used to occur at Matley Passage. *Dolichopus atratus*, *Pipunculus unicolor*, *Criorrhina oxyacanthae* (I took *C. floccosa* in Denny Wood in 1911 and at Newport in Wight in 1907), *Sericomyia borealis*, and *Chrysotoxum bicinctum* were all distinctly rare, with a single *Alophorus hemi-*

ptera. *Metopia urgyrocephala* and *Sphixapata conica* occurred at bees' nests in sand. But most disappointing were the Hymenoptera: the only notable Ichneumon was *Anisobas hostilis*, whereof a single specimen exactly as the former is recorded in my Ichn. Brit. i, p. 211, on 28th; the Chalcids, *Comys scutellata* on *Myrica* in Boldrewood and *Trigonoderus princeps* on a bored hawthorn in Ashurst Wood are worth mention. In the Matley sand-pit Fossors abounded: *Pompilius rufipes*, *P. plumbeus*, *P. spissus*, *Salius exaltatus*, *Amnophila campestris*, *Psen equestris*, *Orybelus uniglumis*, *Crabro pubescens*, and a single *C. signatus*. *Vespa rufa* and *noregica* were captured, and hornets were not rare; and in the above sand-pit were a few *Sphecodes subquadratus* with abundance of *Andrena argentata*, though none of their inquilines.—
CLAUDE MORLEY, Mouks Soham House, Suffolk: *August 1919.*

Hemiptera, etc. in the New Forest.—The following species of Hemiptera have been captured by myself in the New Forest during the past three weeks—*Drymus piceus* Flor (= *Lamproplax sharpi* D. & S.)*, several specimens, mostly more or less immature, *Plociomerus fracticollis* Schill., sparingly [*P. luridus* Hahn was not to be seen this year, though I have taken it freely from Sphagnum in the Forest in October], *Notochilus limbatus* Fieb., one example, Aug. 7th, *Pachycoleus rufescens* Sahlb., rarely, *Ceratocombus coleoptetratus* Zett.*; one specimen, and *Hebrus pusillus* Fall. and *H. ruficeps* Thoms., both in abundance—all in Sphagnum or wet moss; *Cryptostemma alienum* H.-S., in its usual habitat on the banks of streams. Coleoptera were practically over for the season, owing to the excessively hot weather in the earlier part of the summer, and two species only were taken that are worth noting—*Pselaphus dresdensis* Herbst*, very sparingly in Sphagnum, and *Epuraea angustula* Er.*; one example in a Cossus-infected oak. The handsome Aeridiid *Mecostethus grossus* L. was seen on the bog on Acres Down on Aug. 14th. The species marked with an asterisk have not been recorded from the Forest, so far as I am aware.—G. C. CHAMPION, Horsell: *August 18th, 1919.*

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: July 10th, 1919.—Mr. STANLEY EDWARDS, F.L.S., President, in the Chair.

Mr. Moore exhibited *Pyrameis atalanta* from Dunedin, Florida. Mr. Sperring, a series of suffused specimens of *Brenthis euphrosyne* from Lincolnshire, a bred series of *Mimas tiliae*, including ab. *centripuncta*, ab. *suffusa*, and other forms from Blackheath. Mr. Barnett, a large locust sent from Gibraltar alive. Mr. Coppard, several of the larger British saw-flies. Mr. B. S. Williams, aberrations of *Pieris rapae*. Mr. Humphries, larvae of *Lymantria dispar* from Holland, larvae of the Solomon-seal saw-fly, and aberrations of *Aglais urticae* and *Vanessa io*. Dr. Robertson, short series of New Forest "pugs," *Eupithecia*, and a fine series of *Cleora glabaria* bred from New Forest larvae, including one with a minimum of marking bred from a perfectly black larva. Mr. Edwards, *Papilio* species from S. America of the *ascanias* group. Remarks were made on the scarcity of butterflies this season.

July 24th, 1919.—The President in the Chair.

Mr. Sperring exhibited aberrations of (1) *Brenthis euphrosyne* with spots coalesced to form solid lines; (2) *Pararge aegeria*, underside with primrose markings and extended ventral blotch, another with very dark suffused underside; (3) *Amorpha populi*, very dark unicolorous specimen, and a series with wide aberration in banding and in colour. Mr. West, the beetles *Onthophagus taurus* from Malta and Gibraltar, and *O. nutans* from Epping Forest. Mr. Main, living ♀ glow-worms from Delamere and the Isle of Wight, the former only half the size of the latter. Mr. Ash, a *Sirex gigas* taken in the Strand. Mr. Edwards, species of *Papilio* from S. America of the *protesilaus* section. Mr. Carr, pupa-cases of *Chattendenia w-album* in situ on the undersides of the leaves of wych elm.—HY. J. TURNER, *Hon. Editor of Proceedings*.

NOTES ON THE COLEOPTERA OF BRITISH GUIANA.

BY G. E. BODKIN, B.A., DIP.AGRIC. (CANTAB.), F.Z.S., F.E.S.
Government Economic Biologist, British Guiana.

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British Guiana.)

In common with the other families of Insects from this British Colony, very little is known as to the actual species of beetles and less of their habits and life-histories. The only previous attempt to draw up a list of the known species with which I am familiar is that by Schomburgk*; scattered references to British Guiana Coleoptera are widely distributed through the world's entomological literature.

The present paper is based on eight years' collecting and observations. The collecting has been largely performed by myself, often during spare time as opportunities have occurred and also whilst on official visits to different parts of the Colony. The collection preserved in this laboratory consists of about 2,300 specimens and 264 named species. The identifications have been made in nearly every instance through the agency of the Imperial Bureau of Entomology; a few have been performed in the United States National Museum through the courtesy of Dr. L. O. Howard, Chief of the Bureau of Entomology, U.S. Department of Agriculture.

I am indebted to the following gentlemen for specimens and in some cases observations:—Messrs. R. Ward, R. Service, E. M. Morgan, A. A. Abraham, L. D. Cleare, Jnr., C. C. Dowding, P. M. De Weever, W. G. Claxton, H. W. B. Moore, and W. D. Cleary.

* Richard Schomburgk, Fauna und Flora von Britisch-Guiana. Leipzig, 1848.

Dr. G. A. K. Marshall, Director of the Imperial Bureau of Entomology, has very kindly given me much assistance in the matter. Where only one specimen of a species has been collected or where information concerning the habits, life-history, etc., is lacking I have given the locality of collection.

CICINDELIDAE.

Odontochila chrysia Fabr.—Yarakita, N.W. District.

O. marginegutta Dej.—Occurs in high grass and readily takes to flight. Botanic Gardens, Georgetown.

O. batesii Thoms.—This species appears to use its wings more than its legs. Common in some interior districts.

O. cayennensis Fabr. (*bipunctata* Fabr.).—Tumatumari, Potaro R.

O. chiriquana Bates.—Upper Mazaruni R.

Cicindela hebraea Kl., var.—A maritime species. Common on the sands of the foreshore in vicinity of Georgetown. Very difficult to catch owing to its quick erratic flight.

C. hemichrysea Chevr.—Issororo, N.W. District.

CARABIDAE.

Pheropsophus acutinoctialis Linn.—A common species especially in the interior. On being violently disturbed it ejects, with some force from the anal extremity, a small cloud of liquid which in contact with the human integument produces a dark brown stain very difficult to remove. A strictly nocturnal species; during the day it lurks beneath stones and logs of wood, sometimes in small communities.

Tetragonoderus variegatus Dej.—From dry sandy foreshore. Suddie, Essequibo.

Agridia guyanensis Chand.—At artificial light. Issororo, N.W.D.

Lia sellata Dej.—Agatash, Essequibo R.

Leptotrichelus dorsalis Fabr.—Botanic Gardens, Georgetown.

DYTISCIDAE.

Megadytes giganteus Cast.—Georgetown. Not a common species.

M. laevigatus Oliv.—Paraweka Creek, Essequibo R.

M. fraternus Sharp.—Georgetown. Frequently attracted to artificial lights.

Thermonectes margineguttatus Aubé.—Georgetown.

HYDROPHILIDAE.

Hydrophilus ater Fabr.—The common Hydrophilid of British Guiana. At certain seasons of the year appears in large numbers attracted to the arc lights in Georgetown.

STAPHYLINIDAE.

Osorius brasiliensis Guér.—Issororo, N.W.D.

Paederus columbinus Lap.—Issororo, N.W.D.

HISTERIDAE.

Lioderma quadridentatum Fabr.—This beetle is predaceous on other species of insects. It has been observed to attack the larvae of the sugar-cane borer (*Diatraea saccharalis* F.). It occurs commonly.

Homalodes sobrinus Er.—Issororo, N.W.D.

TEMNOCHILIDAE.

Temnochila chalcea Kirsch.—Rockstone, Essequibo R.

COCCINELLIDAE.

Megilla maculata DeG.—Observed to be predaceous on the larvae of the Rice-Caterpillar, *Laphygma frugiperda* S. & A. Common on the coastlands.

Hyperaspis festiva Muls.—Predaceous on the Coccid *Pseudococcus sacchari* Ckll. Occurs commonly.

H. octopustulata Fabr.—Predaceous on the Coccid *Pseudococcus sacchari* Ckll. Occurs commonly.

H. trilineata Muls.—Predaceous on the Coccid *Pseudococcus sacchari* Ckll. Occurs commonly.

Brachyacantha 10-pustulata Melsh.—Predaceous on a species of *Pseudococcus* (undet.). An uncommon species.

Halyzia divisa Fabr.—Appears to be found on a species of *Puccinia* fungus on the Canna plant.

Azya trinitatis Mshll.—Predaceous on the Coccid *Aspidiotus destructor* Sign.

A. pontibrianti Muls. Predaceous on the Coccid *Saissetia hemisphaerica* Targ.

Cryptognatha nodiceps Mshll.—Predaceous on the Coccid *Aspidiotus destructor* Sign., also on the early stages of *Aleurodicus coccus* Curtis.

Neda dilychnis Muls.—Predaceous on the Coccid *Aspidiotus destructor* Sign.

N. conspicillata Muls.—Skeldon, Berbice.

Curinus coeruleus Muls.—Uncommon. Botanic Gardens, Georgetown.

Pentilia insidiosa Muls.—Predaceous on the Coccid *Asterolecanium bambusae* Bd., also on *Pseudococcus citri* Risso.

EROTYLIDAE.

Aegithus clavicornis Linn.—Issororo, N.W.D.

Cypherotylus dromedarius Lacord.—Onderneeming, Essequibo.

C. elevatus Fabr.—Issororo, N.W.D.

Zonarius indicus Herbst.—Issororo, N.W.D.

Morphoides tricinctus Dup.—Onderneeming, Essequibo.

Homoiotelus umbonatus Lacord.—Issororo, N.W.D.

Pselaphacus curvipes Guér.—Issororo, N.W.D.

P. giganteus Germ.—Issororo, N.W.D.

P. puncticollis Guér.—Issororo, N.W.D.

ENDOMYCHIDAE.

Amphix cinctus Fabr.—Onderneeming, Essequibo.

SCARABAEIDAE.

COPRINAE.

Eurysternus planus Dalm.—Koriabo Creek, N.W.D.

Canthon triangularis Drury.—A common and widely distributed species. Frequently found in proximity to dung or carrion.

C. quadriguttatus Ol.—Suddie, Essequibo.

C. sordidulus Harold.—An uncommon species from the interior forest regions.

Pinotus lucasi Harold.—Upper Mazaruni R. (Nov. 1916, G.E.B.).

Phanaeus festivus L.—Occurs only in the interior. All the specimens in this collection came from the Paraweka Creek, Essequibo R.

P. lancifer Linn.—This handsome species is only encountered within the forest area. Paraweka Creek, Essequibo R.

GESTRUPINAE.

Athyreus excavatus Cast.—Issororo, N.W.D.

ORPHNINAE.

Aegidinus guianensis Westw.—Suddie, Essequibo.

APHODIINAE.

Ataenius opacus Harold.—Taken on one occasion in a trap-light, Botanic Gardens, Georgetown.

MELOLONTHINAE.

Barybas bifoveolatus Curt.—Mazaruni R.

DYNASTINAE.

Megasoma actaeon L. The largest beetle in British Guiana and of fairly common occurrence all over the Colony. The male, in average-sized specimens, has a wing expanse of 8 inches and a total body length of just under $4\frac{1}{2}$ inches. As far as I know no one has yet succeeded in definitely establishing a relationship between certain immense Scarabaeid larvae which are occasionally found in trunks of decaying forest trees and the adult form of this beetle. They are the largest Coleopterous larvae found in the Colony. The female is smaller than the male and has no horns. I once succeeded in keeping a male alive for several weeks on a solution of sugar and water which it readily imbibed.

Strategus aloeus Fabr.—This beetle is a pest of young coconut palms in the Colony. It has been given the local name of "cockle." Only the adult beetles actually damage the palms. Plants up to about two years old are damaged by the adults boring down into the soil in close proximity to the roots and gradually destroying them and the heart of the palm itself. They often penetrate to a depth of several feet. It is usual in large plantations to employ a man whose sole duty it is to watch for "cockles" and destroy them either by carbon bisulphide or by pouring a quantity of water down into their burrows which causes them to come to the surface. The species is widely distributed all over the Colony. The larvae are usually found in small colonies in the decaying stumps of trees.

The following note concerning the larval and pupal stages has been made by Mr. L. D. Cleare, Jnr.:—

" Larvae from Mango root brought in 19.vii.15. Placed in jar containing leaf mould. Buried itself. Moistened from time to time. Pupated 22–23 x.15 about 3 inches below the surface on the *bottom* of the jar in a cell about $3 \times 1\frac{3}{4}$ inches. The cast larval skin was packed close in one end of this cell and was at the caudal extremity of the pupa when the cell was opened. The pupa appeared to lie most of the time on its back.

The pupa is a yellowish-brown (burnt sienna) colour about the thorax, the abdomen being lighter. On the prothorax the three 'horns' are quite noticeable, the cephalic one being best developed and standing out about $\frac{1}{8}$ inch. The elytra are thick and bent under, almost covering the underwings. A fine median ridge extends down the thorax. A double row of very large spiracles down the centre of the abdomen. These spiracles are very noticeable objects, there being apparently two pairs to each segment except the 1st, 6th, 7th, and 8th, where there are but a single pair. They lie adjacent except on the 8th segment where they are about $\frac{1}{4}$ inch apart. The claspers are large and bear a dark brown piliferous area on the dorsum. The head is slightly bent under the thorax, the mouth-parts being well formed. On the underside the strong legs are, however, the most noticeable. The first pair are brought close up against the head, while the second pair lie partly over the wing-cases. Where the femora of these two pairs of legs meet they form a raised circular area. The third pair extends from beneath the second pair of wings, which, on the underside, are about $\frac{1}{8}$ inch longer than the elytra. On the tibiae of the first pair there are four teeth, and while the second pair of tibiae also possess these they are very poorly developed. The underside of the abdomen is pale yellowish, being darker between the segments. There is a very distinct woody odour about the pupa."

The larvae must live for a considerable time. They are occasionally eaten by the Aboriginal Indians of the Colony.

S. jugurtha Burm.—An uncommon species from the interior, Bartica, Essequibo R.

Phileurus quadrituberculatus P. de B.—Paraweka Ck., Essequibo R.

P. valgus Linn.—On two occasions this beetle has been taken from coconut palms, one of which was suffering from "Bud Rot." Occurs also in the interior districts.

P. didymus Linn.—Issororo, N.W.D.

Cyclocephala subsignata Burm.—Paraweka Ck., Essequibo R.

C. oculum Bates.—An uncommon species and widely distributed.

C. bicolor Linn.—Paraweka Ck., Essequibo R.

C. dimidiata Burm.—A common species on the coastlands. Strongly attracted to artificial lights.

C. lunulata Burm.—A fairly common and widely distributed species.

C. gravis Bates.—Paraweka Ck., Essequibo R.

C. castanea Oliv.—Paraweka Ck., Essequibo R.

C. fulgorata Burm.—Upper Mazaruni R.

Ligyrus ebenus DeG.—A common species often taken at electric arc lamps in Georgetown. On one occasion an adult beetle was discovered to have bored its way into a full-grown stem of sugar-cane. Widely

distributed. Known locally, in common with all black similarly-shaped beetles—regardless of exact species—as “hardback.”

L. tumulosus Burn.—An uncommon coastland species. Occurs commonly in the West Indian island of Barbados.

Dyscinetus geminatus Fabr.—A common species at the arc lamps in Georgetown. On the advent of heavy rains especially after drought swarms of these beetles appear at artificial lights and often cause serious inconvenience at the dining table and other social and domestic functions. The larvae apparently breed in the decaying vegetable matter at some distance below the surface of the soil. Many thousands are destroyed by a heavy fall of tropical rain which floods the land. Occurs also in the interior.

D. bidentatus Burn.—This beetle is a pest of sugar-cane. The adult form bores into the stems and rooting systems. They are more prevalent at certain times of year than others. It is only during recent years that this insect has developed into a serious nuisance. As many as 38,000 of these beetles have been collected by gangs on one sugar estate during one year. The life-history occupies about 100 days.

Mr. Harold Moore, a local entomologist, has investigated the life-history. He writes as follows:—

“The ‘hardback’ eggs are milk-white and globular, their shortest and longest diameters at the time of hatching being about 2 mm. and $2\frac{1}{2}$ mm. respectively. A few days earlier they may be $1\frac{3}{4}$ mm. and 2 mm. At time of deposition they are probably a good deal smaller even than this. They are laid in the earth about the cane stools at a depth of about 2 to 5 or 6 inches below the surface. At the close of the incubation period the young larva can be discerned in a curled attitude through the egg-shell, the red mandible being very distinctly visible.

The newly hatched larva is white, with red mandibles, and short reddish hair. The head soon becomes yellow. Shortly after feeding begins the larva becomes darker owing to the contained earthy matter being visible through its transparent skin. Eggs obtained on 23rd were hatching on the 29th and 30th of the month, but they had probably been laid some days before I got them. The legs are six in number, rather long and slender.

The adult larva is dirty white, save the posterior end which is dark brown to almost black on account of the accumulated excrement. The segments are wrinkled and clothed with short reddish hair, while the head is yellow. The duration of the larval life is not known, but it probably extends to several months.

The pupa is enclosed in an earthen cell, rough externally but smooth and neat internally. The duration of this stage is also not known, but is probably short as compared with that of the larva.”

A SYNOPSIS OF THE BRITISH SIPHONAPTERA, by the Hon. N. CHARLES ROTHSCHILD, M.A., F.L.S., illustrated by Eight Plates (issued in the Ent. Mo. Mag. for March, 1915, pp. 49-112), price 1s. 6d. Apply to the publishers.

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THE MUSEUM, HULL;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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Chingford Branch. The Chingford Local Branch meets at the Avenue Café, opposite Chingford Station, at 8 p.m., on the 2nd Monday in each month.

Oxylygyrus zoilus Oliv.—Attracted to artificial lights. Issororo, N.W.D. The adult beetle performs very considerable damage in this district by boring into the fully grown tubers of *Tapias* (*Colocasia xanthosoma*).

Stenocrates laborator Fabr.—Issororo, N.W.D.

RUTELINAE.

Pelidnota cayennensis Fabr.—Issororo, N.W.D.

P. virescens Burni.—Issororo, N.W.D.

Antichira convexa Oliv.—Hills Estate, Mazaruni R.

Rutela lineola Bates.—On the coastlands a common species of phytophagous beetle. Usually found in small clusters which readily take flight. The species varies considerably in its yellow markings.

R. lineola Bates, var. *histrio* Saldb.—An uncommon variation of *lineola* taken in the vicinity of Christianburg, Demerara River.

Macraspis chrysis Linn.—This phytophagous species is often troublesome to cultivated plants such as mangoes, roses, etc. Occurs almost exclusively within forest area. Widely distributed, generally in small communities.

M. splendida Fabr.—A rare species. Paraweka Ck., Essequibo R.

Anomala limbaticollis Blanch.—Paraweka Ck., Essequibo R.

A. undulata Melsh.—Tumatumari, Potaro R.

Lagocheile bipunctata MacL. (= *brunnea* Perty). Issororo, N.W.D.

CETONIINAE.

Gymnetis maculosa Oliv.—A rare species. Botanic Gardens, Georgetown.

G. liturata Oliv.—Canje Creek, Berbice.

G. ocellata G. & P.—Georgetown, Demerara.

PASSALIDAE.

Neleus punctiger Serv.—A common and widely distributed species. Invariably found in decaying stumps of trees, both on coastlands and also within forest area. Always in small colonies of a dozen or so. Both larval and imaginal forms stridulate violently on being disturbed. On a casual inspection the larva appears to have only four legs. A closer investigation shows that the posterior pair are imperfectly developed

and apparently used for stridulating purposes. One of the commonest of British Guiana beetles.



BUPRESTIDAE.

Euchroma hunteri Sharp.—A common species of Buprestid especially in the interior. It takes flight readily during the day if disturbed and flies strongly with a loud humming sound. The Aboriginal Indians frequently make necklaces of the elytra. On one occasion I was fortunate to secure the eggs of this beetle from a specimen sent in captivity from the Botanic Gardens, Georgetown. Two small clusters of about a dozen each were deposited. In shape they were stoutly cigar-shaped, with one end slightly truncated, and in colour pale creamy yellow. The mass was enveloped with a sticky secretion with which they were glued down to the surface of the box. The surface of the ova bore slight, unevenly shaped reticulations. Length 6·00 mm., breadth 3·50 mm. Several larvae hatched from these eggs but none survived.

Stenogaster linearis Linn.—A fairly common species on the coastlands. I have always taken it on a plant known as Black Sage (*Cordia anbletti*).

Actenodes nobilis Linn.—Rockstone, Essequibo R.

Psiloptera hirtomaculata L. & G.—East Bank, Demerara R. A rare species.

Agrilus setipes Chevr.—Botanic Gardens, Georgetown.

EUCNEMIDAE.

Fornax mendax Bony.—Tumatumari, Potaro R.

ELATERIDAE.

Chaleolepidius striatus Linn.—A widely distributed species of common occurrence.

Pyrophorus noctilucus Linn.—This well-known luminous beetle is frequently met with in the forest area.

Atractosomus plebeius Cand.—Issororo, N.W.D.

Triplonychus cayennensis Er.—Upper Mazaruni R.

Adelocera pollinaria Cand.—Upper Mazaruni R.

A. rubra Perty.—Kaituma R., N.W.D.

Aeolus quadrimaculatus Cand.—Issororo, N.W.D.

Cardiorrhinus bilineatus Fabr.—Issororo, N.W.D.

Ischiadontus inornatus Cand.—Phn. Anna Regina, Essequibo.

Eudactylus interruptus Oliv.—Taken from sheathing-leaf base of coconut palm affected with bud-rot. West Bank, Demerara R.

DASCILLIDAE.

Artematopus puncticollis Champ.—Tumatumari, Potaro R.

LAMPYRIDAE.

Lucio abdominalis Cast.—Rockstone, Essequibo R.

Aspidosoma sticticum Gemm.—Christianburg, Demerara R., also Uitvlugt, West Coast, Demerara.

A. ignitum Linn.—Uitvlugt, West Coast, Demerara. The common firefly of British Guiana.

Hyas flabellata Fabr.—Issororo, N.W.D.

Lucidota guttula Fabr.—Suddie, Essequibo.

Photinus occidentalis Oliv.—Suddie, Essequibo.

LYCIDAE.

Culopteron tropicum Linn. (*fasciatum* Fabr.).—Berbice R.

C. tricolor Oliv.—Issororo, N.W.D.

(To be continued.)

A CERAMBYCID INFESTING PINE CONES IN INDIA,

CHLOROPHORUS STROBILICOLA, n. sp.

BY H. G. CHAMPION, B.A., F.E.S.,
Assistant Conservator of Forests, W. Almora Division.

(PLATES XIII AND XIV.)

While in the U.S. of America in 1915, I was much interested in the work being done by the Forest Insect branch of the Bureau of Entomology, in the investigation of the insects attacking the seeds and fruits of forest trees. With the help of members of the Bureau, I saw not a few of the beetles *in situ*, including species of a Scolytid genus in *Pinus* spp. and a Buprestid in the cones of *Pinus ponderosa*. Search for Coleoptera of similar habits in the pine forests of the Himalaya was rewarded by the discovery of numerous cones infested by a Cerambycid larva which is the subject of this note. I am much indebted to Mr. Craighead, of the U.S.

Bureau referred to, for numerous suggestions, and to Dr. Gahan, Keeper of Entomology at the British Museum, for his opinion on the adult. The insect is not included in the last-named author's "Fauna of British India," Coleoptera, Vol. I, 1906, and as it is unknown to him, the species is assumed to be new.

Ovum.

Sausage-shaped, slightly curved on long axis, semi-opaque white in colour, .75 × .25 mm.

Larva.

Form cylindrical, broadest at the prothorax and tapering rapidly behind in the last 3 segments: white, except for the chitinised mouth-parts, and an ill-defined yellowish area in the front portion of the prothorax; rather smooth and shining, but thinly pubescent with rather long pale hairs especially anteriorly. Head strongly retracted into the prothorax; clypeus narrow; labrum broader than long, hairy; mandibles typical of subfamily, with gouge-shaped cutting edge; labial palpi 3-jointed, apical joint subconical, about $1\frac{1}{2}$ times as long as broad; maxillary palpi slightly larger than the labial, 3-jointed, apical joint subconical. Antennae rather conspicuous when fully exserted, 3-jointed, basal joint trapezoidal and rapidly tapered, second cylindrical, longer than broad, and bearing the narrow cylindrical 3rd joint and a small papilla. A large single ocellus irregularly pigmented near base of antenna. Prothorax as viewed from above about three times as broad as long, and equal to the 1st abdominal segment, quite smooth and shining. Legs minute, being only about $1/10$ the length of the large thoracic spiracle, 3-jointed; fold bearing the prothoracic leg extending up in front of the spiracle for a distance equalling the length of the latter. Abdomen parallel-sided, ampullae not pronounced, slightly rugose, but shining and smooth otherwise.

Length full grown 12.5 mm., width 2.5 mm., length of leg .04 mm.

Life-History.

The eggs are laid singly in the crevices between the scales of the full-sized green cones of *Pinus longifolia* (15 months old), about 15–20 on each cone, at the end of June and beginning of July, the large middle scales and the shaded slightly concave side of the cone being chosen. The eggs are so well concealed as to be easily overlooked even when specially searched for, and are in the deepest cracks with their long axis along the crack. The larvae hatch in about two weeks and bore direct into the cone under the egg-shell without ever becoming visible from without, their activity being only betrayed by the appearance of a very

little fine wood powder, and no marked flow of resin seems to occur. The larvae feed on the internal woody tissues, chiefly in the cellular parts of the scales and central axis, avoiding the more strongly lignified vascular tracts. During the cold weather the infested cones usually get broken off by wind and fall to the ground without injury to the larvae within, which then complete their metamorphosis still inside the cones. The effect of the infestation on the cones is largely determined by the number of developing larvae; in the usual case of a dozen or more, the development of the cone is rapidly stopped even before it has time to assume the external appearance of a sound mature cone, so that it remains rather small and retains the glossy surface of the incompletely hardened stage; the cone also becomes very light and the scales never separate, with the result that in the dry weather the infested cone can readily be recognised on the ground. On breaking open the cones in this stage (which is very easily done), they are found to be full of very fine dry wood dust. When only a few larvae are feeding in a cone none of these characteristics are so marked and their presence may be overlooked; the cone scales may open out normally, but apparently fertile seed is not developed.

Pupation takes place in April almost always in the broad scale-heads, but sometimes in the central axis or other parts, an emergence hole being carried up to the outer shell of the cone but not through it. The pupal stage lasts about two weeks, after which the almost colourless adult emerges; two days later the markings are clearly outlined in pale mauve colour, and in about 7–10 days the coloration is fairly matured, though complete hardening is slow.

The earliest and latest dates of emergence actually recorded are 14th April and 15th May, but probably much depends on altitude, etc. Emergence from the cone through oval holes in the scale-head probably does not take place in Nature till about the beginning of the rains in June. As many as 16 adults have been reared from a single cone.

In spite of three years' collecting in the area frequented by this insect, the adult has never been found in the forest, though it seems very likely that the species visits flowers like its allies (it does so in captivity); it very readily takes to wing in sunshine and is generally an active insect. Pairing takes place soon after emergence from the cone, and cases were observed where the sexes remained *in copula* for over 24 hours sleeved over a branch of pine out of doors. Afterwards the female, having found a cone to her liking, sets to work to explore the whole surface with her extended ovipositor for suitable crevices in which to deposit the relatively large ova.

The above may be considered the normal life-history, but there are indications that variations on it are not uncommon ; the chief of these is that probably some larvae take two years to feed up, as it is possible to find in a cone containing both pupae and adults, one or two small but healthy larvae, or to find in the winter old-looking cones with emergence holes and in addition one or two larvae. This also received partial confirmation when still infested cones, which had not fallen, so that their age could be definitely recognised as three years from pollination, were found to show old emergence holes as well as to contain larvae and pupae. This fact could also, of course, find an explanation in that the emerging adults in the previous year had oviposited in the same cones, but this suggestion receives no confirmation.

Distribution.

Throughout the chir (*Pinus longifolia*) forests of the W. Almora Forest Division, and probably of Kumaon, if not further. The altitude range is practically that of the chir, 3500–6500 feet, and the insect is commonest in open sunny stands. The extent of the damage done is probably almost negligible in a good seed year, but when cones are few, the proportion infested may rise to quite an appreciable figure, and locally in 1918 and 1919 may have reached 40 per cent or more, almost every cone on some trees being attacked. Probably in non-fire-protected areas a good many infested cones are burnt on the ground, but the only other check on its multiplication noted in three years is a fungus which sometimes kills the larvae, these latter appearing to dry up and to become very brittle, and on being broken across are seen to be full of a dense white mycelium ; as, however, adults may be bred out from other larvae in the same cone, this disease cannot be a very important factor. Cones have been seen from which woodpeckers had extracted seed without touching the larvae whose burrows were disclosed. It will be remembered that there is no break in the surface of the cone while the larvae are feeding, so that they are protected by a complete hard and smooth shell, and this may account for their freedom from Hymenopterous parasites.

General Remarks.

Infested cones were first collected in 1917 and a few adults were bred out in the rains of that year. More were obtained in the following season and an effort made to observe oviposition, but without success. In 1919 this attempt was repeated, the adults being sleeved out of doors over shoots of pine carrying old cones which had shed their seed in March 1919 and new ones that were due to do so in 1920 and 1921. Ova were

soon obtained, though at first overlooked by me, as they are so well hidden. It must be noted as a fact of some significance that the only cone selected for oviposition was one whose peduncle had been injured and the cone somewhat discoloured in consequence; the 1919 and 1921 cones were altogether ignored.

Breeding is simple as all stages are apparently well adapted to withstand any injury from being shaken about in the cone—some survived 30 or 40 rough marches with coolie carriage, the cones being kept in boxes or tins under conditions which would be far too dry for most insects. Pupae taken from the cones can be kept in small glass tubes closed with a twist of paper, and they also stood the treatment described.

IMAGO.

Chlorophorus strobilicola, n. sp.

Moderately elongate, subopaque, the elytra shining: rufous or reddish-brown, the eyes, scutellum, metasternum, and abdomen, the elytra with at least the apical portion, and sometimes the posterior femora towards the apex and the tips of the antennae, infuscate or black; the elytra each with a curved narrow fascia before the middle, extending forwards along the suture to the base and interrupted on the outer part of the disc, a short longitudinal streak within the humeral callus, a common narrow subapical fascia, and sometimes a small patch at the apex, cinereous or whitish, the rest of the pubescence of the upper surface sparser and darker, that of the under surface close, and in great part whitish or cinereous, the legs cinereo-pubescent and with a few projecting hairs; the head and prothorax closely, roughly punctate, the elytra densely, very finely punctate. Antennae rather more than half the length of the body, a little longer in ♂, joints 6-10 rapidly decreasing in length in ♀. Prothorax convex, transverse in ♀, nearly as long as broad in ♂, rounded at the sides. Elytra moderately elongate, somewhat flattened on the disc, truncate at the apex, the outer apical angle sharp. Basal joint of posterior tarsus about as long as the others united. Length $7\frac{1}{2}$ - $9\frac{1}{2}$, breadth 2-3 mm. (♂ ♀.)

Hab. INDIA, W. Almora in Kumaon.

Numerous examples, bred at various times from the cones of *Pinus longifolia*, and probably not quite fully coloured. The nearest allied species appear to be the Palaearetic *C. trifasciatus* F., *C. ruficornis* Oliv., and *C. nigripes* Brullé, all of which have much broader whitish fasciae, the latter being almost as narrow as in *C. mossiliensis* L. The Indian forms enumerated by Dr. Gahan under *Caloclytus* (= *Chlorophorus*) are all



Chlorophorus strobilicola.

very different from *C. strobilicola*. The type of the latter has been presented to the British Museum.

EXPLANATION OF PLATES.

PLATE XIII.

Chlorophorus strobilicola.

Fig. 1. Ovum, $\times 5$.

2. Larva, adult, dorsal view, $\times 5$.
3. " " profile view, $\times 5$.
4. " " mesothoracic leg, $\times 150$.
5. " " head (left half omitted), dorsal aspect, $\times 70$.
6. " " " ventral aspect, $\times 70$.
7. " " labium, detached and viewed from above, $\times 70$.
8. " " details of mandible, greatly enlarged : *a*, viewed laterally, from outside ; *b*, from inside ; *c*, from above.

PLATE XIV.

Fig. 9. Cone of *Pinus longifolia*, sixteen months old, reduced by $\frac{1}{6}$, showing position of eight ova of *Chlorophorus strobilicola*.

10. Detached cone-scales, enlarged, showing position of emergence holes of the beetle : *a-c*, typical scales ; *d*, showing relative position of all the eight emergence holes of one cone.

W. Almora.

July 19th, 1919.

NEW SPECIES OF STAPHYLINIDAE FROM CEYLON.—PART I.

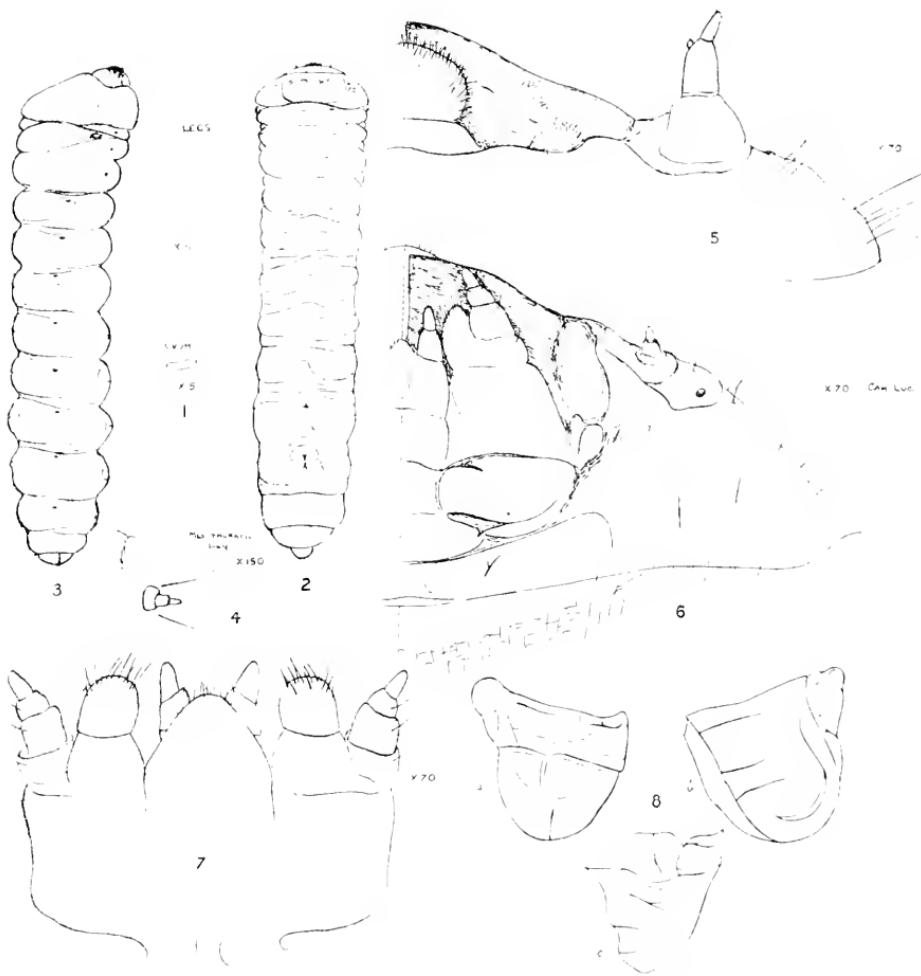
BY MALCOLM CAMERON, M.B., R.N., F.E.S.

This paper contains descriptions of *Staphylinidae* in the collection of the British Museum (Natural History) made by Mr. G. Lewis in 1882. In it have also been included two or three species obtained by Mr. G. E. Bryant in 1908, the types of which are in my own collection. Unless specially noted, the types of the others are in the Museum. The species described in Part I are as follows :—

<i>Trogophloeus (Thinodromus) lewisi.</i>	<i>Medon (s. str.) championi.</i>
" <i>(Boopinus) peregrinus.</i>	" <i>basalis.</i>
" <i>(s. str.) nitidipennis.</i>	<i>Neobisnius rufipennis.</i>
<i>Oxytelus (Anotylus) monoceros.</i>	<i>Philonthus tripluinctatus.</i>
" " <i>distinctiollis.</i>	" <i>pubipennis.</i>
<i>Astenus hindostanus.</i>	" <i>versicolor.</i>
" <i>taprobanus.</i>	<i>Conosoma montanum</i>
<i>Medon (Charichirus) ceylonicus.</i>	

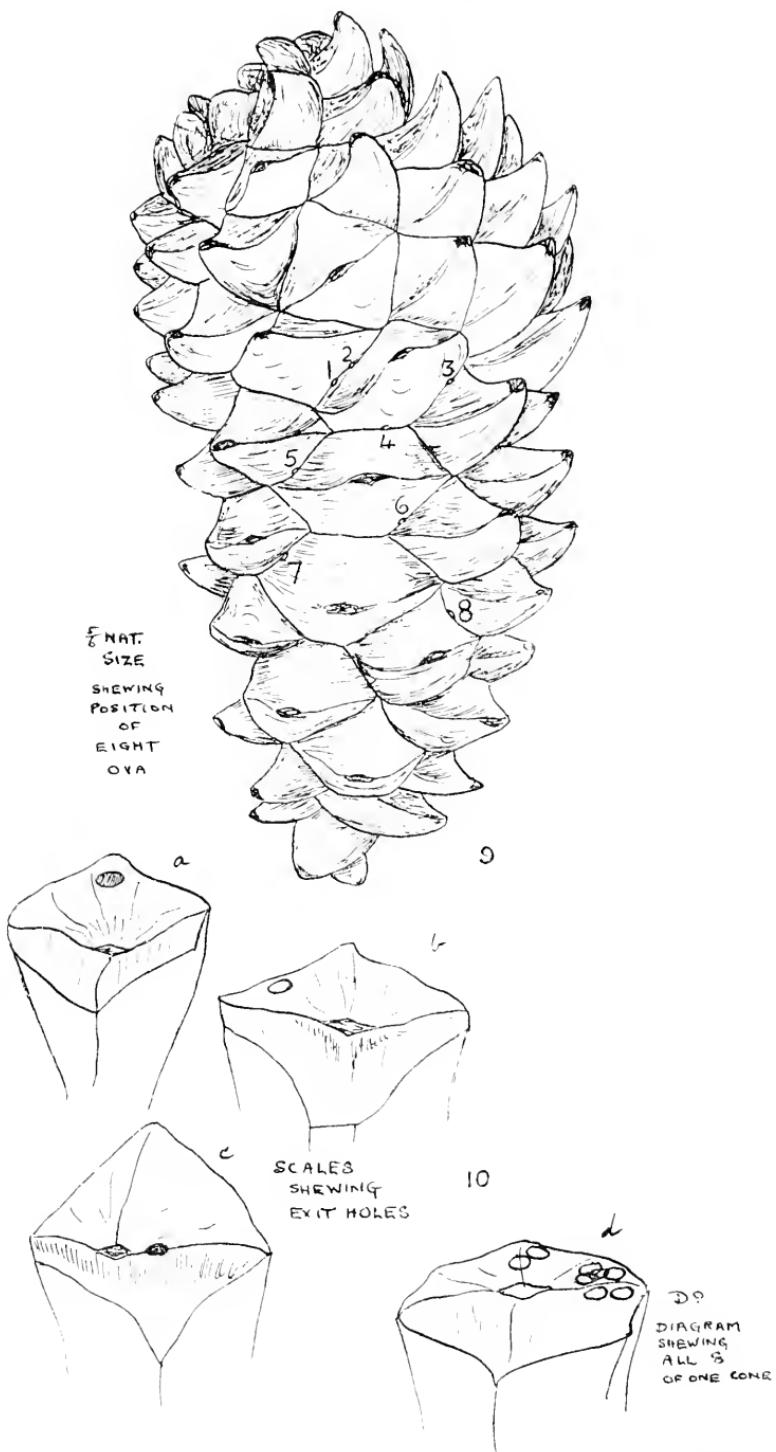
Trogophloeus (Thinodromus) lewisi, n. sp.

Black, moderately shining; palpi pitchy, first joint of the antennae and legs reddish-testaceous, the tibiae pitchy. Length 3 mm. Head narrower than the



H. G. C. del.

LARVA ETC. OF *CHLOROPHORUS STROBILICOLA*.



H. G. C. del.
CONE OF *PINUS LONGIFOLIA* ATTACKED BY *CHLOROPHORUS*
STROBILICOLA.

thorax, the eyes large, occupying nearly the whole extent of the sides, the front with shallow longitudinal impression internal to the antennal tubercles; puncturation moderately fine and very close, a little more sparing in front. Antennae long, extending to a little behind the level of the shoulders; 2nd to the 7th joints all elongate, the first three of them subequal in length, 5th, 6th, and 7th gradually decreasing, 8th as long as broad, 9th and 10th very slightly transverse, the 11th short, oval. Thorax transverse, the sides strongly contracted behind, dilated and rounded in front, before the base with a deep crescentic impression, the disc on either side of the middle line with an obscure rounded impression; puncturation as on the head, but less close. Scutellum impunctate. Elytra broader and a little longer than the thorax, transverse, ample, moderately finely, closely punctured; pubescence fine, grey. Abdomen moderately narrowed posteriorly, rather finely, closely punctured throughout, more coarsely at the bases of the anterior segments, finely pubescent.

Hab. Kandy (*G. Lewis*).

This species shows no ground sculpture and the puncturation of the abdomen differs but little from that of the fore-parts. It appears to make the passage to the subgenus *Carpalimus*.

Trogophloeus (Boopinus) peregrinus, n. sp.

Black, moderately shining, the elytra brownish red; antennae and legs reddish-testaceous. Length 2·5 mm. Almost identical in build with *T. politus* Kies., except that the elytra are longer, the antennae are shorter, and the thorax has four somewhat obsolete impressions on the disc; the puncturation of the thorax and elytra stronger, that of the abdomen less dense and the pubescence more sparing. Eyes large, occupying nearly the whole side of the head, which is finely and closely punctured. Antennae with the 3rd joint scarcely shorter than the 2nd, the 4th to the 7th longer than broad, gradually decreasing in length, 8th, 9th, and 10th about as long as broad, but stouter than the preceding, 11th rather short, oval. Thorax about one-half broader than long, the sides strongly rounded in front and moderately strongly convergent behind; the disc with four somewhat obsolete impressions; puncturation moderately fine and close. Elytra broader and about one-third longer than the thorax, square, the puncturation very similar to that of the thorax. Abdomen finely and moderately closely punctured and pubescent throughout.

Hab. Kitulgalle, Colombo (*G. Lewis*).

Trogophloeus (s. str.) *nitidipennis*, n. sp.

Black; head and thorax entirely dull, elytra and abdomen shining; thorax without trace of impressions; antennae and legs reddish-testaceous, the 2nd to the 8th joints of the former a little infuscate. Length 2·4 mm. Very distinct by the completely dull head and thorax (which is without impressions) and the shining elytra and abdomen. Head broad, a little narrower than the thorax; eyes small, their diameter about equal to the length of the temples, which are constricted behind; the front without impressions; the whole surface densely coriaceous and opaque, without visible puncturation. Antennae

with the 3rd joint shorter than the 2nd, the 4th to the 6th a little longer than broad, the 7th to the 10th somewhat transverse, the 11th short, oval. Thorax transverse, widest before the middle and about one-half as broad again as long, the sides moderately rounded in front and rather strongly convergent behind; the disc without trace of impressions and similarly sculptured to the head. Elytra broader and a little longer than the thorax, transverse, shining, often more or less brownish, moderately finely and somewhat closely punctured. Abdomen slightly widened behind, shining, very finely and by no means closely punctured and pubescent.

Hab. Dikoya (*G. Lewis*).

Oxytelus (Anotylus) monoceros, n. sp.

Black, shining, elytra yellow; thorax with the sides evenly rounded, the posterior angles completely effaced; first joint of the antennae and legs testaceous. Length 2·3-3 mm. Head in the ♂ large,* transverse, nearly as wide as the thorax, transversely depressed between the antennal tubercles, the anterior border in front of the right antennal tubercle produced into a short pointed triangular process, so that the front is asymmetrical: vertex without fovea; sculpture posteriorly consisting of larger and smaller and not very closely placed punctures, anteriorly impunctate and coriaceous, but shining; eyes moderately large, their diameter about equalling the length of the temples, which are rounded behind: in the ♀ smaller, subtriangular, the anterior border evenly rounded; sculpture as in the ♂, but the front with a row of punctures just behind the anterior margin and a small fovea on the vertex. Antennae with the 2nd and 3rd joints equal in length, the 4th small, moniliform, the 5th to the 10th transverse, gradually increasing in breadth. Thorax nearly one-third broader than long, the sides evenly rounded, the posterior angles effaced; median sulcus complete, extending the whole length of the disc, the lateral grooves deeper and broader, curved, not quite reaching the anterior margin, the sides strigose; puncturation scattered and moderately large. Elytra as long as and slightly broader than the thorax, transverse, feebly strigose, rather sparingly and moderately coarsely punctured. Abdomen coriaceous, very obsoletely and sparingly punctured.

♂. 6th ventral segment furnished on either side of the middle line with a rather long, triangular, pointed tooth, the two teeth diverging from each other; 7th segment foveate in the centre, the posterior margin produced into a subquadrate plate which is rounded behind in the middle line, deeply emarginate on either side.

Hab. Colombo, Belligam, Nuwera Eliya (*G. Lewis*).

Type in my own collection.

Oxytelus (Anotylus) distincticollis, n. sp.

Black, shining, the elytra brown, the thoracic sulci more or less obsolete; first five joints of the antennae and legs reddish-testaceous. Length 3·3 mm. Easily recognised by the very indistinct thoracic furrows, but structurally

* A form of ♂ with the head scarcely differing from that of the ♀ is also found.

presenting no difference from the genus *Oxytelus*. Head transverse, the eyes moderately large, the temples long, broadly rounded behind; the front transversely depressed between the antennal tubercles, smooth, shining, almost impunctate, the rest of the surface coarsely, closely, and rugosely punctured. Antennae with the 2nd joint about as long as the 3rd, the 4th small, as broad as long, the 5th to the 10th transverse, gradually increasing in width, the 11th short, oval. Thorax very nearly one-half broader than long, feebly rounded at the sides, narrower at the obtuse posterior angles than anteriorly; the disc with a narrow, shallow, obsolete furrow throughout the whole length of the median line, and on either side with a broader yet more obsolete impression posteriorly, scarcely traceable beyond the middle, the sides rather broadly impressed; the whole surface coarsely, closely, and rugosely punctured. Elytra a little broader than, and half as long again as, the thorax, slightly transverse, the sculpture consisting of moderately coarse, somewhat closely placed granules. Abdomen with sculpture consisting of moderately large, superficial, closely placed, obsolete punctures, the interspaces raised so that the surface appears irregular and granular, the 7th and 8th segments nearly smooth.

Hab. Bogawantala (G. Lewis).

The specimen described is ♀.

Astenus hindostanus, n. sp.

Narrow, elongate, black, the head and thorax scarcely, the elytra and abdomen distinctly, shining, the former posteriorly narrowly testaceous; antennae filiform, testaceous; legs testaceous. Length 5 mm. Less robust than *A. bispinus* Motsch., with narrower head, shorter, more shining, simply punctured elytra, the posterior border of which is narrowly testaceous, and much less coarsely punctured head and thorax. Head oblong, the temples long, gradually narrowed and rounded: sculpture close and umbilicate. Antennae long and slender, all the joints much longer than broad, the 2nd joint shorter than the 3rd, the 10th and 11th but little shorter than the 9th. Thorax a little narrower than the head, longer than broad, narrowed behind, the anterior angles broadly rounded, the sides with three setae. Elytra as long as and scarcely wider than the thorax at the anterior angles, narrowly bordered with testaceous posteriorly, coarsely, closely, and simply punctured, the interspaces smooth and shining. Abdomen elongate, shining, coarsely and closely punctured, especially at the bases of the segments; 7th and 8th segments almost smooth; anal styles reddish-testaceous.

♂. 6th ventral segment with a deep, parallel-sided excision of the posterior border, the apex of which is rounded: 5th with a moderately broad triangular excision of the posterior margin, and a deep rounded impression anterior thereto.

Hab. Colombo, Kandy, Nuwera Eliya (G. Lewis).

Astenus taprobanus, n. sp.

Narrow, elongate, rufo-testaceous, a little shining, the suture of the elytra very narrowly blackish in the posterior half; antennae and legs yellow.

Length 5 mm. Build of *A. hindostanus*, but with narrower head and more gradually narrowed temples, thorax less narrowed behind, longer elytra, shorter antennae, and entirely different coloration. Head oblong, the temples gradually and slightly contracted posteriorly, the posterior angles rounded; puncturation coarse, close, and umbilicate. Antennae slender, but shorter than head and thorax, all the joints longer than broad, the 2nd shorter than the 3rd, 5th to the 8th scarcely differing in length, the 11th a little longer than the 10th. Thorax oblong, a little narrower than the head, gradually narrowed behind, the anterior angles broadly rounded, the puncturation as on the head. Elytra as long as and a little broader than the thorax, longer than broad; puncturation coarse, close, and simple. Abdomen elongate, a little widened behind, rather coarsely and closely punctured, especially at the bases of the segments, the 7th and 8th segments much more finely and sparingly punctured; pubescence moderate, yellow, intermixed with black setae.

Hab. Dikoya, alt. 4000 feet (*G. Lewis*).

The specimen described is ♀.

Medon (Charichirus) ceylonicus, n. sp.

Black, slightly shining; the elytra brown, the posterior and reflexed lateral margins and legs reddish-testaceous; antennae reddish. Length 5·5 mm. Exactly of the same size and build as *C. chinensis* Boh., but differing in the following respects: the antennae are a little stouter, the penultimate joints being as long as broad; the fore-parts are distinctly more shining and the sculpture coarser; the smooth median line of the thorax is much broader; and the elytra are otherwise coloured. Head subquadrate, a little broader than the thorax; the eyes moderately large, their diameter less than the length of the temples, which are rounded posteriorly; puncturation close, obscurely umbilicate, and rugose. Antennae with the 2nd joint shorter, than the 3rd, the 3rd to the 6th longer than broad, gradually decreasing in length, 7th scarcely longer than broad, 8th to the 10th as long as broad. Thorax scarcely shorter than broad, a little narrowed behind, disc with distinct median smooth elevated line throughout; sculpture consisting of close granules, each with a minute central pit. Elytra a little broader and about one-third longer than the thorax; brown, the lateral reflexed and posterior borders indeterminately rufo-testaceous; sculpture very similar to that of the thorax. Abdomen with the posterior margins of the segments narrowly reddish-testaceous, very closely and finely punctured, closely and finely pubescent throughout.

Hab. Kandy (*G. Lewis*).

The specimen described is ♀.

(*To be continued.*)

OBSERVATIONS ON THE HORSE BOT-FLY, *GASTROPHILUS EQUI* F.

BY A. H. HAMM, F.E.S.

The phenomenally fine and hot weather during the first half of August last was evidently highly favourable to that well-known pest, the Bot-fly (*Gastrophilus equi* F.). My holiday falling within the same period enabled me to give some attention to and make a few observations on this species.

On August 7th, in Hogley Bog, near Oxford, I netted one male and two females from round the legs of a mare turned out to grass. The flies are very easy to catch if only the horses will stand still for a moment and allow one to approach; but this was by no means easy, for at the least movement of the net the horse invariably galloped away, so that the stalking had to be begun over again. However, with persistence and patience the three specimens were at length secured. The number of eggs laid on this particular horse was truly astonishing. From below the knee to just above the hoof they were so close together that they entirely covered the hair on the anterior surface of the fore legs. Many were also laid on the hind legs, shoulders, hind-quarters, and a few even on the mane. I drew the owner's attention to her condition and he promised to do what he could to remove them. I had another look at her on the 10th when she was fairly free from eggs, and no bot-flies were in attendance. I did not see her again until the 23rd, which was a very dull and not over warm day, but the eggs that had again been deposited were equally or even more numerous than those observed on the 7th.

On August 10th on Lye Hill, adjoining Hogley Bog, a number of farm horses, turned out to grass, were all huddled together under the shade of some large elm trees, and owing to the presence of *Haematopota* and various other flies they were extremely restive. They allowed me, however, to approach near enough to see that several female bot-flies were busy ovipositing. Every horse had a large number of eggs attached to various parts, mostly the fore legs below the knees.

On August 11th I went to Newbury for a few days. Crossing Victoria Park, close to the town, on the 16th, I saw a group of four or five horses close together in the shade of an avenue of lime trees. The shrill bee-like hum of the bot-flies in attendance about the horses' legs was perfectly audible at several yards distance. By dint of patience and caution I secured five specimens, all females. All the horses were much infested with their eggs, as before mainly on the fore legs, below the knees. At various places in the neighbourhood I examined many

horses employed in harvest operations, and found most of them badly infested.

I went over to Woolhampton, 6 miles from Newbury, on August 14th, and on the following day saw several horses under elm trees in a field. A few bot-flies flying round their legs rendered them extremely restive, so much so indeed that at the least flick of the net they would scatter at full gallop round the field, returning again later to the same spot for the shade. The bot-flies apparently accompanied them on their gallop, for no sooner did they stand still than they were subject to the same attentions as before. At Woolhampton I examined many horses at work, or turned out to feed, and found, as at Newbury, most of them badly infested with eggs.

Though I closely watched the flies many times and for considerable periods, I never saw one settle on a horse. Their mode of ovipositing is to hover close to the animal, the body approaching the vertical; then, still hovering, the long ovipositor-like abdomen is turned upwards to attach the egg to the hair. The horse seems fully conscious of the fly's intention, for no sooner does the tip of the abdomen touch the animal than it gives a twitch or brings its head to the threatened spot, or a flick of the tail if on the hind-quarters or hind legs. Though driven off for the moment, the fly returns and succeeds by her persistency, and so absorbed is she that capture would be extremely easy if only the horse would stand still.

I have heard it stated that shade gives the horse some relief from these attacks, but so far as I observed little or no protection is afforded by it.

22 Southfield Road, Oxford.

September 11th, 1919.

Notes on the Staphylinid genera Hoplandria Kr. and Coenonica Kr.—
Hoplandria was said by Kraatz (Linn. Ent. xi, 1857, p. 4) to have the anterior tarsi 4-jointed. Sharp (Biol. Centr.-Amer., Coleopt., i, 2, p. 219, 1883) modified the description as regards the palpi, observing that a minute accessory joint was present which had been overlooked by Kraatz. I find that a further modification is necessary, as the anterior tarsi are really 5-jointed, and the genus must be placed near Aleochara, with which it likewise conforms in the structure of the palpi. By Fenyes, however (Gen. Insect., Pt. 173 a, Aleocharinae, 1918, p. 19), it is accepted as one of the Myrmecionini.

Coenonica, also described by Kraatz (*op. cit.*, p. 45), was defined as having "tarsi antici 4-, posteriores 5-articulati," so that the structure of the intermediate pair is not definitely stated. Fenyes (*op. cit.*, p. 18) places it in

the Myrmeconiini: this is incorrect, the tarsal formula being 4, 4, 5, and the affinities of the genus are with *Homalota* Mannerh. amongst the Bolitocharini. It was further stated by Kraatz to be Termitephilous, but the habitat is at the sap of felled trees and under sappy bark, and any association with Termites is accidental.—M. CAMERON, 7 Blessington Road, Lee, S.E. 13 : August 29th, 1919.

Coleoptera at Dunster, Somerset.—From April 12th I spent three weeks at Dunster, a quaint old-fashioned Somerset village about two miles from Minehead and a mile and a quarter from the shore of the Bristol Channel. The weather was fine, though persistent N.E. winds prevented insects from showing themselves openly, and in consequence collecting was chiefly confined to working bark and old stumps. Only an occasional beetle was seen on the roads, and very few under stones. The following are some of the better species taken; had the season been a less backward one doubtless many more might have been captured. Amongst the Geodephaga may be noted *Harpalus honestus* Duft. (taken at Porlock Weir), *Cillenus lateralis* Sam. exceedingly abundant on wet sands near Dunster, and *Bembidium rufescens* Guer. sparingly in old stumps. The "Staphs" included *Aleochara euniculorum* Kr. in rabbit burrows near golf links, *Myrmeconia funesta* Gr. in ants' "ruins," *Leistotrophus nebulosus* F. on road, *Philonthus splendens* F. and *P. addendus* Shp., *Cafius fucicola* Cart. and the much more abundant *C. xantholoma* Gr., *Medon brunneus* Er., *Homalium planum* Payk. (under bark) and *H. lacriusulum* Gyll. *Cerylon histeroides* F., *Paromatus flavigornis* Hbst., *Epiraea obsoleta* F. (the only species of this genus observed), *Ips quadriguttata* F. and a nice series of *Pediocus dermestoides* F. occurred under bark. In hard black fungus growing on an old ash, *Diphyllus lunatus* F. was found in great numbers, and in the same habitat I took several *Cryptophagus ruficornis* Steph., one *Mycetophagus atomarius* F. and several *Litargus bifasciatus* F., and one *Henoticus serratus* Gyll. was obtained under bark of oak. *Scaphidium quadrimaculatum* Ol. occurred once or twice under wood chips. In a sandy meadow near the sea I dug up a series of *Geotrupes mutator* Marsh. and *Oonthophagus coenobita* Hbst. *O. vacca* L., and *O. fracticornis* Preyss. A most unpromising-looking, old, and very dry felled elm produced four examples of *Corymbites bipustulatus* L., two with bright red shoulder spots and two almost entirely black. On the shore *Microzoun tibiale* F. was much in evidence, with a few *Opatrum sabulosum* L. In a dead fir-branch I was much pleased to find one *Hypophloeus linearis* F. in company with numbers of *Pityogenes bidentatus* Hbst., but diligent search failed to secure more of the *Hypophloeus*. From a rotting elm trunk I dug up several *Ischnomera coerulea* L., and also *Rhyncolus lignarius* Marsh., and in a log by the shore I took *Caulotrypis aenopiceus* Boh. *Hylesinus fraxini* Pz. was very abundant in elms, and *Dryocoetes villosus* F. occurred under bark of oak: whilst *Hypera variabilis* Hbst. and *Sitones waterhousei* Walt. were also taken. A single *Meloe violaceus* Marsh. put in an appearance one dull, sunless day, but was the only specimen of the genus I saw.—JAMES E. BLACK, Nethercroft, Peebles: September 17th, 1919.

Odontaeus mobilicornis Fab. in Wiltshire.—I found a black ♂ specimen of *O. mobilicornis* Fab. near Tidworth Pennings in the first week of August. The

insect was dead in an empty bucket, and was almost the only beetle that I took while at the O.T.C. camp on that part of Salisbury Plain.—GEORGE B. RYLE, 6 Chesham Place, Brighton : *September 15th, 1919.*

Coleoptera of the Brighton District: a correction.—In the August number of this journal I mentioned *Ayabus biguttatus* as having been taken “in a small roadside ditch”; Mr. Tottenham has kindly pointed out to me that *A. guttatus* was the species which we found.—GEORGE B. RYLE.

Further localities for Platypus cylindrus F.—In the last number of this magazine (p. 208) my friend Mr. Claude Morley, when recording *Platypus cylindrus* from the New Forest, states that Fowler gives the following localities:—Windsor, Shipley, New Forest, Monmouth, Herefordshire, and Scarborough, “with no additions to these in the Supplement.” If he will look at page 319 of the Supplement he will see—“*Platypus cylindrus* F., Chiddingfold, not uncommon (*Donisthorpe*).” This rare Scolytid used to occur rather freely in stumps of oak, the wood being so hard that it could only be split by much labour with an axe. I have seen a number of the beetles boring into such stumps with remarkable rapidity. Their round borings are stained black, and no doubt the insect makes use of an acid of some kind to soften the wood. Mr. Champion has also taken *Platypus* in Surrey, at Hurst Wood near Chilworth.—HORACE DONISTHORPE, Putney : *September, 1919.*

Choerocampa nerii at Huddersfield.—Mr. S. L. Mosley, of our Technical College Museum, this morning brought for my inspection a specimen of *Choerocampa nerii* which was found by a working-man in a yard in King Street, Huddersfield, early in the present month. The man, knowing nothing about it, unfortunately kept it in a box for some days before taking it to Mr. Mosley on the 11th, when it was still alive, but as might have been expected, considerably damaged, by the edges of the fore wing being a good deal frayed. It had evidently been a good specimen when first captured, and even yet makes quite a presentable one. There is only one previous record of the species for the county, a poor example at Sheffield on September 11th, 1867.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield : *September 17th, 1919.*

The sound-producing organ of Deinacrida megacephala Buller.—In the Cambridge Natural History, “Insects,” Part 1, p. 327, it is pointed out that “the fact that a clicking noise is produced by the Weta-punga is of some interest, for the genus *Deinacrida* is among the *Locustidae* that possess ears, but are said to be destitute of sound-producing organs.” Being very familiar with the stridulation of our common species, *Deinacrida megacephala* Buller, it appeared desirable to ascertain, if possible, precisely how the sound was produced. No trace of any special organ could be found on the femur of the hind legs, but a careful examination of the side of the second abdominal segment of both sexes, clearly reveals, in the living insect, the presence of about six minute file-like ridges which are evidently operated upon by the inner edge of the base of the femur of the hind legs, these legs being raised high above the insect’s back when it is stridulating. By this means the Weta can produce a rather harsh grating, or clicking, sound which is unquestionably employed to

intimidate intruders and probably also used as a call or lure between the sexes. This sound is frequently heard in New Zealand forests at night.—G. V. HUDSON, Hillview, Karori, Wellington, New Zealand : *July 6th, 1919.*

Diptera in Perthshire.—The following *Diptera* taken by me this season appear to be worthy of mention : *Oxycrea dires* Lw., ♂, Aberfoyle, June 21st, on the same ground where the species occurred in 1903. It must be very scarce, as I have searched for it on several occasions during the intervening sixteen years without success, and the ♀ still escapes detection ! *Symphoromyia crassicornis* Pz., ♂, Balquhidder, June 26th. Seems to be a rare species in Scotland. I have only once taken it before—at Comrie in 1907. *Therioplectes micans* Mg., 2 ♀ ♀, Loch Voil, June 26th. I saw others, but failed to capture them. Nethy Bridge, as mentioned in "British Flies," vol. v, p. 355, appears to be the only recorded Scottish locality for this fine Tabanid. On the same day, and almost on the same spot, I got ♂ ♂ of *Therioplectes distinguendus* Verri., *Haematopota crassicornis* Whlb., and *Chrysops relictus* Mg., ♀ ♀ of the latter were in great numbers at the side of Loch Lubnaig on June 20th. *Isopogon brerirostris* Mg., Callander, June 19th; a rare species in my experience, but I have it from a wide district of Perthshire extending from Aberfoyle to Comrie. *Physocephala nigra* Deg., ♀, Aberfoyle, July 1st, my first capture of this fine Conopid. *Poliotes hirticura* Mde., ♂ ♀, Callander, June 25th. This is only the second recorded capture of the ♀—cf. Ent. Mo. Mag., 1906, p. 269. *Hydrotaea pilipes* Stein, ♀, Callendar, June 28th. A new locality for this rare fly. In addition to the above I got a *Mydaea* and a *Trichopticus*, which are not in the British List, but I cannot name them. I also got at Callander a ♂ *Eristalis*, which I thought at first was *vitripennis* Strobl, as the wings are clear, and the hind femora whitish yellow on about the basal fourth; but the colour of the body pubescence does not agree with the rest of the description, and I am afraid it is only *rupium*, of which I took several typical examples. The specimen seems quite mature.—A. E. J. CARTER, Monifieth : *September 2nd, 1919.*

A Note on four British Coccids.—Newstead, in his Monograph of the British Coccoidea, vol. ii, gives two localities for *Kermes quercus* (Linn.), Wimbledon Common and Sherwood Forest. Green has, if I remember rightly, had this species sent to him from Yorkshire. On June 19th, 1919, I found specimens of it on two oak trees at the edge of the wood not far from the Windmill on Wimbledon Common, but not in any large quantity. Isolated individuals were scattered over the trunk and lower branches. On August 31st, 1919, the same species was found on oak trees in Richmond Park. Every tree standing in the open examined—and about 100 trees were examined—had the scale in the crevices of the bark, very often in very considerable numbers. On examining the spinneys, however, it was found that the scales were confined to those oak trees at the margin, and always on the side of the trunk and branches facing outwards. Captain James Waterston, of the Imperial Bureau of Entomology, tells me that he had noticed this scale, or a nearly allied species, in Macedonia, and that it seemed to be confined to isolated oak trees. In 1914 and 1915 the same ground in Richmond Park was frequently gone over, but never once was this scale observed. A great many of the specimens were heavily parasitised, but it was apparently too late in the year to obtain any of

the parasites. The numbers of the scale and the area over which it is spread seems to point to a disturbance of the conditions under which it previously was kept in check. Has the military occupation of Richmond Park had any effect on the bird life, and this reacted on the Kermes? On September 9th, 1919, Mr. K. G. Blair brought me several examples of *Orthezia urticae* (Linn.), which he had obtained at Shoeburyness, feeding on *Artemisia maritima*. Newstead seems to think it a local insect, recording it on *Glaux maritima* and *Statice amurensis*, both maritime plants; while Douglas found it on *Stellaria holostea*. In August I found *Orthezia cataphracta* (Shaw) under stones amongst beech leaves under beech trees on the Experimental Estate of the North of Scotland College of Agriculture, Craibstone, near Aberdeen. Over 100 females, many with the marsupium fully developed, were bottled in a few minutes. Several were found on the roots of seedling beeches, the leaves of which had a sickly and wilted appearance. This species has been found under beech trees in several other localities in the same district. On September 7th, 1919, Mr. S. A. Brokenhouse sent to the Natural History Museum several specimens of *Eriopeltis festucae* Fonseca on *Festuca ovina*. He says that this species is common on the coast road between Ilfracombe and Combe Martin.—F. LAING, British Museum (Nat. Hist.): *September 18th, 1919.*

Review.

“CATALOGUE SYSTÉMATIQUE ET DESCRIPTIF DES COLLECTIONS ZOOLOGIQUES DU BARON EDM. DE SELYS LONGCHAMPS.” Libellulinen: fasc. xvi (deuxième partie). Pp. 1043-1278, figs. 605-692. By Dr. F. Ris. Brussels, 1919. Price 60 fr. 50.

Notwithstanding a long and laborious life, mainly devoted to the study of the Odonata, that great master of dragonfly-science, Baron Edmond de Selys Longchamps, had to leave to another hand the revision of the large and important subfamily of the *Libellulinae*. That task was carried out, with a substantial measure of success, by Mr. W. F. Kirby, who in 1889 published a revision of all the genera then known, and added to them 40 more of his own. At the same time he described 55 new species (not 42, as stated by Kirby himself) from the material in the British Museum (Natural History). Further contributions to the scientific study of the group were made by later writers, but it was not until Dr. F. Ris, of Rheinau, Switzerland, undertook to monograph the *Libellulinae* for the Selysian Catalogue that a thorough-going revision, both as to genera and species, came into being. The first fascicle of this monumental work was published at Brussels in 1909, and succeeding instalments followed one another at short intervals until virtual completion was attained in 1913. There still remained to be issued the index and the descriptions of a large number of new species which had come into the author's hands during the progress of the work. Although the printing of this additional matter was finished in 1916, publication could not be proceeded with during the continuance of the War, and, according to the postmark, the copy under review did not leave Brussels until 6th August, 1919. The title-page bears two dates—the actual year of printing, 1916, and the nominal date of distribution, 1st March, 1919. A circular-letter, signed by Monsieur G. Severin, explains the reasons why publication did not follow immediately upon

the printing, and urges that, in the exceptional circumstances of the case, the delay in distribution should not be permitted to militate against the priority of the newly-described species. This final instalment, it may now be said, is in every way a worthy successor of the eight parts of the same monograph which have gone before it, and the author is to be congratulated upon the completion of his magnificent contribution to the literature of the Odonata.

The completed monograph consists of 1278 quarto pages, embodying a full and authoritative description, written in German, of every species known at the present time. A new scheme of classification has been adopted, whereby the genera are arranged in ten "groups" of co-ordinate value, beginning with small Old World forms of the *Tetrathemis* type, and ending with forms, like *Pantala* and *Tramea*, having a specialised venation and an expanded anal area in the hind wing. The work is illustrated by 8 coloured plates and 692 text-figures of wing-venation, accessory genitalia, and anal appendages, and is altogether indispensable to every entomologist who desires to study the conspicuous and beautiful insects included in the *Libellulinae*. Dr. Ris's monograph is the third relating to dragonflies so far published in the Selysian Catalogue, the first and second, by Monsieur René Martin, dealing with the subfamilies *Corduliinae* and *Aeschniinae*, respectively. Two fascicles on the *Calopteryginae*, likewise by M. Martin, are already in manuscript, and the monographing of other groups is being provided for.

The foregoing remarks have necessarily been concerned with the Odonata exclusively, and with the *Libellulinae* in particular. Moreover, as dragonflies form the bulk of the collections upon which the Selysian Catalogue is based, those insects occupy a commensurate degree of importance in the Catalogue. But it is not to be forgotten that de Selys Longchamps also gathered together much material in other groups of animals, notably such insects as were formerly included in the old but wholly artificial Order called Neuroptera. Fascicles dealing with the Embioptera, Plecoptera, Megaloptera, *Ascalaphidae*, and Trichoptera, for instance, have already appeared, and others on the Mecoptera, and *Myrmeleonidae* and other Planipennia are stated to be in the press. Particulars of the contents of the Catalogue and of the terms of subscription can be obtained from Monsieur G. Severin, Conservateur au Musée Royal d'Histoire Naturelle de Belgique, 31, Rue Vautier, Brussels.—HERBERT CAMPION.

Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY :
August 14th, 1919.—Mr. STANLEY EDWARDS, F.L.S., President, in the Chair.

The death of Lieut. F. H. Wolley-Dodd, F.E.S., in the Dardanelles was announced.

Mr. Blair exhibited black aberrations of *Cetonia aurata* from St. Mary's, Scilly. Mr. Turner, a series of large and bright *Epinephele jurtina* race *hispanula* from the Plains of Catania, Sicily, and a long series of *Adscita geryon* from near Tring, Herts, where it had been very plentiful this season. Mr. Buckstone, (1) *Boarmia cinctaria* from the New Forest; (2) *Tarniocampa munda*, bred and captured, Oxshott, Wimbledon, etc.; (3) *Adopaea flava* (*thaumas*), a dark ♀ taken at Boxhill on August 18th; (4) *Aphantopus hyperantus*, undersides

showing gradation in colour and spotting, including ab. *arcte*; (5) larvae of *Cosymbia pendularia* from bred females of a brood of which some pupae appeared to be going over; and (6) he reported that seven out of ten pupae of *Tephrosia luridata* were apparently going over. Mr. Bennett, specimens of *Acronicta leporina* and *Hylophila prasinana* from Chislehurst. Remarks on the season showed that Noctinae were scarce, sugaring was a failure, honeydew had been very detrimental to larvae, that a late frost had probably affected *Agriades coridon* badly, and that white butterflies and *Polyommatus icarus* were also scarce.

August 25th, 1919.—The President in the Chair.

Mr. B. S. Williams exhibited *Hibernia marginaria (progemmaria)*, typical from Yeovil, ab. *fuscata* from Finchley and St. Anne's-on-Sea, with intermediate forms. Mr. Newman, a fine bred ab. *walkeri* of *Spilosoma menthastris* from Bexley. Mr. H. J. Turner, for Mr. Greer of Co. Tyrone, a long series of *Hydrocia crinancensis* taken at honeydew on thistles, and a pair of *Epinephele jurtina* ab. *addenda* which appears to be a local race in Co. Tyrone. Mr. Ashdown, *Opilo mollis* and *Gracilia minutula* from Surrey, and stated that one of the specimens of the latter was the smallest Longicorn he had ever seen. Mr. Sperring, soft grey forms of *Boarmia repandata* from Scotland, *Agriades coridon* ♂♂ with much black suffusion and a *striata-obsoleta* form, and a varied series of *Aglais urticae*, Paisley. Mr. Johnson, several examples of *Limenitis sibylla* almost completely black, and aberrations of *Dryas paphia* with very considerable coalescence and elongation of the usual markings. Mr. Bennett, a larva of *Acronicta leporina* feeding on oak. Mr. Edwards, *Papilio protodamas (hyperion)*, *P. phaon* ab. *ulepos*, and *P. philenor* ab. *acanda* from S. America. Reports of the season were made by several members.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

SOME INDIAN COLEOPTERA (I).

BY G. C. CHAMPION, F.Z.S.

This paper deals with a few of the Coleoptera sent me during the past five years by my two surviving sons, both in Government Service in India. A certain number of their insects (*Dianous*, *Planeustomus*, *Scaptia*, *Mycetophagus*, *Xylophilus*, *Melanophila*, etc.) have already been described or noticed by me in this Magazine or elsewhere; but amongst the small forms there are representatives of various Palaearctic genera not yet recorded from that country. These beetles, the Carabidae and Curelioniidae excepted, are not likely to be studied at present by any of the contributors to the "Fauna of India," and it is desirable that the presence south of the Himalaya of certain genera of other families should be made known at the first opportunity, e.g., the collections before me include numerous *Ochthebius* and *Hydraena*, not a single species of either of which is recorded from India. The description of a

new *Bruchus* received from Dehra Dun by the botanical department of the British Museum, and of a *Spercheus* from Karachi in the Andrewes collection, are included in the present contribution.

Species enumerated in the present contribution.

HYDROPHILIDAE.

- Epimetopus asperatus*, n. sp.
- **Spercheus gibbus*, n. sp.
- “ *belli*, n. sp.
- “ *binodulus*, n. sp.

HETEROCERIDAE.

- **Miclus minutissimus* Sahlb.
- SILPHIADA.**
- Hydnobius contractus*, n. sp.

TROGOSITIDAE.

- **Thymalus indicus*, n. sp.

COLYDIIDAE.

- Teredolaemus major*, n. sp.

MYCETOPIHAGIDAE.

- Mycetophagus bifasciatus*, n. sp.

ANOBIIDAE.

- **Stagetus denticornis*, n. sp.

XYLOPHILIDAE.

- Xylophilus bulbifer*, n. sp.
- **Cnopus pinicola*, n. sp.

BRUCHIDAE.

- Bruchus caeruleus*, n. sp.
- “ *maculipyga*, n. sp.

Epimetopus asperatus, n. sp.

Robust, broadly obovate, convex, moderately shining, nigro-piceous, the apex of the elytra and the legs more or less rufescent, the palpi and antennae in part testaceous. Head granulate, triangularly depressed on each side within the oblique, almost smooth reflexed lateral margins of the clypeus, the eyes large and almost divided. Prothorax short, convex on the disc, deeply constricted near the base, widening thence to the prominent, obliquely truncated anterior angles, and broadly produced in the middle in front; the surface closely granulate, and with several scattered, minute, smooth tubercles extending across the middle, and an oval, marginated prominence in the centre of the anterior prolongation, the disc obsoletely canaliculate. Elytra broader than the prothorax, rapidly widening to beyond the middle, and (as seen from above) broadly produced at the apex, the sides rounded and narrowly explanate; closely granulate and narrowly catenulate-striate, the granules on the alternate interstices towards the sides and apex here and there developed into very small smooth tubercles, which form a short (humeral) ridge at the base of 7 and a short ridge at the apices of 3 and 5. Legs stout, the tibiae broad, with longitudinal rows of asperities, thus appearing costate. Length $3\frac{1}{2}$, breadth 2 mm.

Hab. INDIA, W. Almora in Kumaon (*H. G. C.*).

The description is taken from a single specimen, but others were subsequently captured in the same district. Smaller than *E. (Sepidulum) bullatus* Sharp (Ent. Mo. Mag. xi, p. 249, 1875), type from “India”; the tubercles greatly reduced in size and almost obsolete on the disc of the elytra, the latter narrowly striate, the prothorax strongly constricted

* Genera not previously recorded from India.

before the base. *E. maindroni* Régimbart (1903), from Gengi, has large metallic tubercles like *E. bullatus*.

Spercheus gibbus, n. sp.

Oblong-oval, very convex, shining; dirty-testaceous, the head, prothorax, and elytra mottled with piceous, the apical joint of the maxillary palpi at the tip and the apex of the terminal joint of each tarsus black. Head broad, subtriangular, rapidly, obliquely narrowed from the eyes forward, the raised lateral margins subangulate, the clypeus also angularly raised on each side of the central emargination; the intra-ocular space foveate in the middle and closely punctate, the anterior portion sparsely punctured. Prothorax very short, much wider than the head, moderately explanate at the sides, the latter rounded anteriorly and gradually converging and almost straight behind, the anterior angles prominent, the hind angles subrectangular; closely punctate. Elytra gibbous, evenly convex on the disc, broadly arcuato-explanate at the sides below the base; with closely packed somewhat regular rows of moderately coarse punctures, the narrow interspaces smooth, neither costate nor tuberculate, the outer row of dorsal punctures separated from those along the expanded margin by a rather broad polished space, the humeral callosities prominent. Length $3\frac{3}{4}$, breadth $2\frac{1}{6}$ mm.

Hab. INDIA, Sarda in Bengal (*F. W. C.*).

One specimen, certainly ♂, as shown by the strongly biangulate clypeus. Very like an insect (♂ ♀) from Karachi in the Andrewes collection labelled “*Spercheus belli* Régimbart,” a species not included in Zaitsev’s Catalogue of Hydrophilidae (1908) and of which I am unable to find a published description*; differing from the latter in having the head less explanate at the sides before the eyes (the head thus appearing a little smaller) and distinctly foveate in the middle between them, the prothorax relatively narrower, less rounded at the sides posteriorly, and more sparsely punctured on the disc, and the elytra also a little narrower, with the margins broadly arcuato-explanate below the base, the sculpture similar to that of *S. belli*. In the British Museum there are three examples (♂ ♀) of another small *Spercheus*, labelled as from “India” (*ex coll. Bowring*), apparently different from either of the foregoing, the Museum also possessing very similar specimens from Persia (one of which is labelled *S. cerisyi* Guér.?) and Mesopotamia, as well as others of a smaller and narrower unnamed form from the last-named country, and one from Siam. The type of *S. cerisyi* was from Alexandria. My second son having left Bengal, there is no immediate possibility of obtaining more specimens of *S. gibbus* or of the closely related *S. binodus*. The Indian habitat of the insect from the Bowring collection requires confirmation, and it must be left unnamed

* Two found by Aliuaud in E. Africa were described by Régimbart in Ann. Soc. Ent. Fr. 1906, pp. 271, 272.

for the present. It seems probable that *Spercheus* is well represented in India, as it is known to be in Africa. One species has recently been described from the Philippines.

Spercheus belli, n. sp.

Spercheus belli Régimbart, in coll. Andrewes.

Oblong-oval, very convex, shining; obscure rufo-testaceous, the head, prothorax, and elytra sparsely fuscous-maculate, the apex of the terminal joint of each tarsus black. Head very broad, gradually, obliquely narrowed from the eyes forward, the raised lateral margins subangulate, the clypeus also angularly raised on each side of the central emargination in ♂ and obtusely so in ♀; the intra-ocular space densely, the anterior portion more sparsely, punctured. Prothorax very short, broad, much wider than the head, the margins explanate, rounded, and slightly converging behind; closely punctate. Elytra gibbous, evenly convex on the disc, arcuately explanate at the sides; with closely packed rows of moderately coarse punctures, the narrow interspaces smooth, three of them subcostate towards the apex in ♀, the outer row of dorsal punctures coarse and bordered externally by a polished space, the humeral callosities prominent. Length $3\frac{1}{2}$ -4, breadth $2-2\frac{1}{5}$ mm. (♂ ♀).

Hab. INDIA, Karachi (*T. R. Bell*, in coll. Andrewes and Mus. Brit.).

Two males and one female, all injured by pinning. These insects were examined some years ago by the late Dr. Régimbart, one of them having been labelled by him as "type"; but the description has not been published.

Spercheus binodus, n. sp.

Oblong-oval, very convex, shining; dirty-testaceous, the head somewhat rufescent, the space between the eyes and the disc of the prothorax suffused with piceous, the elytra with scattered darker spots, the maxillary palpi at the tip and the apex of the terminal joint of each tarsus black. Head very broad, closely punctured, the punctures coarser and more crowded between the eyes, the latter large and convex; clypeus broadly emarginate, the reflexed margins moderately prominent, obtusely angulate on each side of the emargination. Prothorax very short, much wider than the head, moderately explanate at the sides, the latter slightly converging posteriorly and feebly rounded, the anterior angles rather prominent; closely punctate, and with an indication of a shallow median groove. Elytra gibbous, uneven, rounded and moderately explanate at the sides, abruptly declivous posteriorly, with numerous irregular rows of rather coarse punctures, and a pallid, smooth, oblong tubercle at the middle of the disc similar to the one on the humeral prominence, the sutural region longitudinally sulcate on the apical declivity; viewed laterally, the elytral surface also appears to be obsoletely quadricostate, the first ridge from the suture limiting the apical groove externally. Length $3\frac{1}{2}$, breadth $2\frac{1}{10}$ mm.

Hab. INDIA, Sunderbans in Bengal (*F. W. C.*).

One specimen, presumably ♀. This insect cannot be the sexual complement of *S. gibbus*, as at first sight would appear to be likely, the

latter having a relatively smaller subtriangular head, straighter sides to the prothorax, and the elytra broadly arenato-explanate before the middle, without tubercles, costae, or apical sulci, their dorsal surface being regularly convex.

Micilus minutissimus.

? *Heterocerus (Micromicillus) minutissimus* Sahlb. Öfv. Finska Vet.-Soc. Förh. xlii. p. 205 (1900).

Hab. INDIA, Sarda in Bengal (*E. W. C.*).

Two specimens from the Ganges region, Bengal, are provisionally referred to this species, the types of which were from Amu Daria (Oxus) and Syr Daria (Jaxartes), Turkestan. They are slightly larger (length a little over 1 mm.) than the measurement given by Sahlberg (0·9 mm.), and have the head red in front (instead of black); but as the types are said to vary in colour, and some allowance must be made for the degree of maturity of these insects, too much reliance need not be placed on these characters. The genus, in any case, has not been recorded from India, the only other known representative being the Mediterranean *M. murinus* Kies., which is a larger and broader insect.

Hydnobius contractus, n. sp.

Oval, very convex, shining; testaceous, the eyes black, the antennal club slightly infuscate. Head broad, finely punctured, the eyes rather small; antennae slender, with the 5-jointed club stout, joint 8 small. Prothorax transverse, rounded at the sides, wider towards the base, the hind angles almost obliterated, the base margined; closely, conspicuously, uniformly punctate. Elytra comparatively short, with regular rows of moderately coarse punctures placed in almost obsolete striae, the striae becoming slightly sinuate on the disc and the puncturing more confused towards the sides, the interstices each with a row of punctures which are scarcely finer than those of the striae, the humeri obtuse. Length 1 $\frac{1}{2}$ mm.

Hab. INDIA, Sarda in Bengal (*E. W. C.*).

One specimen, obviously ♀, the posterior femora being unarmed. Shorter, smaller, and more convex than the European *H. punctatus* and *H. punctatissimus*, the antennae slender, with a stout club. The only described Indian *Hydnobius* is *H. tropicus* Motsch. (Bull. Mosc. xxxix, p. 397, 1866), from the mountains of Nuwera Elia, Ceylon, which is characterized thus:—"Statura et color *H. punctati* sed paulo minor. Ellipticus, subconvexus, vix punetatus, nitidus, fulvo-testaceus, oculis nigris; elytris punetato-striatis, interstitiis planis, subtilissime rugulosis. —Long. 1 l., lat. $\frac{1}{2}$ l." This species, omitted from the "Munich Catalogue," must be different from the one here described.

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AND

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Thymalus indicus, n. sp.

Broad oval, widened posteriorly, shining, thickly clothed with long, fine, erect yellowish pubescence; aeneo-piceous, the explanate margins of the prothorax testaceous, those of the elytra brown, the eyes and mandibles black, the antennae and legs testaceous, the antennal club (except at the extreme tip) piceous; the head and prothorax closely, rather finely punctate. Elytra gibbous, rounded at the sides from the moderately prominent humeri to the apex, widest beyond the middle, the explanate margins broad throughout; the surface rather uneven, impressed with irregular rows of moderately coarse punctures, which become larger and deeper towards the sides, the interstices with scattered very minute piligerous punctures. Length $6\frac{2}{5}$, breadth $4\frac{2}{5}$ mm.

Hab. INDIA, W. Almora in Kumaon (*H.G.C.*: x.1917).

Two specimens. Very like *T. subtilis* Reitt., from the Caucasus, from which it differs in having the elytra a little more elongate, widest beyond the middle, broadly explanate throughout, and rounded at the sides from the base, the disc more coarsely punctured, the humeri less prominent externally. Allied forms occur in Japan. The genus *Thymalus* is apparently an addition of the list of Indian *Trogozitidae*.

Teredolaemus major, n. sp.

Elongate, cylindrical, glabrous, shining; black, the anterior margin of the head, oral organs, antennae and legs, and in one specimen a spot at the side of each ventral segment, ferruginous or testaceous, the femora slightly infuscate. Head broad, closely, finely punctate, the eyes large; antennae with a large broad-oval club, the shining basal portion of which is about as long as the opaque apical portion, the latter bluntly rounded at the tip, the suture between them feebly curved, joint 9 strongly transverse, much wider than 8. Prothorax convex, about as long as broad, slightly compressed and distinctly narrowed towards the base, the latter very feebly bisinuate; finely, rather sparsely punctate. Elytra about two and one-third times the length of the prothorax, flattened on the disc anteriorly, bluntly rounded at the apex; with somewhat irregular rows of fine, approximate punctures placed in almost obsolete striae, the sutural stria continued to the apex, the interstices flat, irregularly uniseriate-punctate (some of these punctures being larger than the rest); the apical declivity rather broadly longitudinally excavate near the suture. Tibiae strongly, angularly dilated at the apex. Length $4\frac{1}{4}$, breadth $1\frac{1}{2}$ - $1\frac{1}{4}$ mm. (♀.)

Hab. INDIA, W. Almora in Kumaon (*H.G.C.*).

Two specimens (one of which is certainly ♀), sent in spirit with various insects found under the bark of *Pinus longifolia*, in which it doubtless preys upon beetle larvae. Larger and broader than of the four described Indian members of the genus (*T. similis* Sharp, and *T. unicolor*, *bimaculatus*, and *concolor* Grouv.), with a differently formed antennal club, and more widely excavate apical declivity of the elytra. The type of the genus, *T. politus* Sharp, from Japan (figured in Journ.

Linn. Soc., Zool. xix, pl. 3, fig. 7, 1886), has a broader, rounded antennal club, formed by the fused tenth and eleventh joints, *Teredolaemus* differing in this way from *Teredus*, which has 11 free joints to the antennae.

Mycetophagus bifasciatus, n. sp.

Oblong-oval, shining, closely, finely pubescent; nigro-piceous, the head at the sides in front, the antennal joints 1-5 and 11, and two transverse angulate fasciae on the elytra—one post-basal, with a ramus extending forwards along the sixth interstice to the anterior margin, and one at about the apical fourth, neither reaching the suture or outer margin—fulvous, the palpi and under surface more or less infuscate. Head densely, finely punctate; antennae rather stout, gradually widened outwards, the infuscate joints 6-10 transverse, 11 oval. Prothorax short, broad, the sides arenately converging from near the base to the obtuse anterior angles, the hind angles rather prominent, the base bisinuate and deeply biforme; closely, not very finely punctate, with very minute punctures intermixed. Elytra moderately long, shallowly punctate-striate, the interstices almost flat, densely, somewhat roughly punctulate. Length 4-4½, breadth $1\frac{9}{10}-2\frac{1}{10}$ mm.

Hab. INDIA, W. Almora in Kumaon (*H. G. C.*).

Four examples, found in June 1918, in a hard *Polyborus* on an old pine stump. Compared with the three Indian *Mycetophagi* already noticed or described by myself in this Magazine (*cf.* liii, pp. 53-55, March 1917), the present insect has very differently maeulate elytra, the antennal structure being similar to that of *M. fraternus* Grouv. The elytra are angulato-bifasciate, as in various fungivorous Tenebrionids, and in *M. antennatus* Reitt., from Japan, and *M. californicus* Horn, from N. America. Compared with the Japanese *M. antennatus*, the antennal joints 6-10 are less transverse and not so stout, and 11 less acuminate, and the elytral markings are reduced to the two incomplete angular fasciae.

Stagetus denticornis, n. sp.

Oblong-oval, very convex, moderately shining, thickly clothed with pale brownish-cinereous, shaggy pubescence; piceous or nigro-piceous, the antennal joints 2-11 ferruginous, the palpi testaceous; the entire upper surface densely, extremely minutely punctulate, with scattered intermixed slightly larger punctures. Head rather broad, transverse; eyes large, emarginate in front; apical joint of maxillary palpi stout, securiform, that of the labial pair also securiform; antennae moderately long, 11-jointed, 1 stout, curved, 2-8 short, 4, 6, and 8 each produced into a short tooth, and 5 and 7 into a longer, curved, dentiform process, on their inner aspect, 9-11 dilated into a long broad, freely 3-jointed, flattened club, 9 about as broad as long, 10 elongate-triangular, 11 elongate-oval. Prothorax short, conical as seen from above, the sides slightly rounded and rapidly converging from the base forward.

Elytra oblong, abruptly narrowed behind, narrowly striated, the striae impressed with fine oblong punctures, the interstices flat on the disc, somewhat convex towards the outer margin, the humeral callus prominent. Beneath densely, minutely punctulate, with coarser punctures intermixed; mesosternum with a compressed, lamiiform, vertical process, which is received in a narrow, deeply-cut groove between the anterior coxae; metasternum smoother in ♀, shallowly grooved down the middle posteriorly, narrowly, triangularly produced in front between the intermediate coxae, the process margined and nearly reaching the hook-like termination of the mesosternal lamina; terminal ventral segment hollowed in the middle posteriorly, more deeply in the specimens assumed to be males. Length 3-3½, breadth 1½-2 mm.



Stagetus denticornis.

Hab. INDIA, W. Almora in Kumaon (H. G. C.).

Bred in great numbers from fungus in June 1917 and again in June 1918. The species differs from *Theca* as defined and figured by Mulsant and Rey (Térédiles, 1864) in the form of the antennal joints 4-7, and in the structure of the anterior portion of the metasternum (the latter being emarginate in the middle in front in *S. byrrhooides*, instead of produced into a short narrow process between the coxae as in *S. denticornis*). The larger examples of the Indian insect with a smoother metasternum and a shallower excavation on the terminal ventral segment are assumed to be females. Schilsky (Käfer Europa's, xxxvi, 1899), in his descriptions of numerous species of the present genus, says that the eyes in some of them are larger in ♂; but no sexual differences in the antennae are mentioned by him, or by Mulsant and Rey or Wollaston. Pie's Catalogue of *Anobiidae* (1912) does not include any species of *Stagetus* (= *Theca*), or of the allied genera *Eutheca* and *Xylotheca*, from the Indian continent. *Stagetomorphus indicus* Pie (1914), from Mahé, must be a very different insect. The name *Theca* Muls. and Rey (1860) is preoccupied in Zoology, and *Stagetus* Woll. (1861) is available for it.

Xylophilus bulbifer, n. sp.

♂. Oblong, rather broad, moderately shining, finely sericeo-pubescent; obscure testaceous, the head and a broad transverse patch on each elytron (not reaching the suture or outer margin) piceous, the legs, palpi, and antennae testaceous; the head and prothorax rather sparsely, minutely, the elytra closely and much more distinctly, punctate. Head transverse, broader than the prothorax, well developed behind the eyes, the post-ocular portions gradually converging and subangulate as seen from above; eyes moderately large: antennae long, slender, joint 2 short, about half the length of 3, 3-10 filiform [11 wanting]. Prothorax about as long as broad, subquadrate, hollowed at the sides behind the middle (appearing subangularly dilated anteriorly, as seen

from above), convex on the disc, and with a deep, arcuate depression (formed by two confluent foveae) before the base. Elytra much wider than the head, moderately long, arcuately narrowing from about the middle, strongly depressed below the base. Legs long, slender; anterior tarsi with joint 1 greatly dilated, convex above, oval, about twice the width of the tibia, 3 conspicuously lobed, broader than 2; posterior femora curved, gradually widened towards the apex beneath, the dilated portion terminating in a short tooth; claw-joint of each tarsus very slender. Length $2\frac{1}{2}$, breadth 1 mm.

Hab. INDIA, W. Almora in Kumaon (*H. G. C.*).

One male. Easily recognizable by the enormously developed basal joint of the anterior tarsi and the curved, dilated, angulate posterior femora. *X. bulbifer* is not very closely related to any of the numerous Indian species recently described by myself. The Bornean *X. latimanus* has somewhat similar anterior tarsi in ♂.

Cnopus pinicola, n. sp.

Oblong, shining, finely pubescent; fusco-testaceous, the head usually darker and the prothorax somewhat rufescent, the antennæ and legs testaceous; the head and prothorax closely, minutely, the elytra more distinctly, punctate. Head strongly transverse, broader than the prothorax, not extended at the sides behind the eyes, the latter convex, prominent; antennæ slender, long in ♂, much shorter in ♀, joint 2 short, rather stout, subglobose, 3-10 subequal in length, 11 much longer, acuminate-ovate. Prothorax transversely subquadrate, slightly narrowed anteriorly, with a deep transverse sulcus before the base, which nearly reaches the outer margin and is sometimes slightly interrupted in the centre. Elytra much wider than the head, comparatively short, narrowed from the middle, transversely depressed below the base. Legs very slender, including the posterior pair, which are scarcely so long as the intermediate pair; basal joint of posterior tarsi shorter than the others united. Length $1\frac{1}{10}-1\frac{1}{4}$ mm. (♂ ♀.)

Hab. INDIA, W. Almora in Kumaon (*H. G. C.*).

Found in some numbers by beating *Pinus longifolia*. A minute, very fragile insect, with the general facies of a small *Melanophthalma* (fam. *Lathridiidae*). The feeble development of the posterior legs and the shortened basal joint of the posterior tarsi bring this insect into the genus *Cnopus*, the two known species of which are from Mexico and the Southern United States respectively. Compared with the type of the genus, *C. flohri* Champ., from Jalapa, the Indian *C. pinicola* is a little more elongate, less shining, and more closely punctate, and has larger eyes and more slender antennæ.

Bruchus caeruleus, n. sp.

Rather narrow, shining, blue or bluish-green, the antennæ black, with the basal joints to a variable extent in ♂, and usually at the base only in ♀,

testaceous, the legs black, the posterior pair blue, the pygidium and apical portion of the abdomen often rufous in ♀, in some specimens metallic as in ♂; very finely pubescent, the prothorax with a dense oblong or subquadrate patch of adpressed, white squamiform hairs at the base, extending forwards along the disc and backwards over the scutellum and the basal portion of the elytral suture, the lateral margins of the prothorax and the sides of the body beneath also thickly clothed with similar squamiform hairs, the general vestiture of the elytra closer on the inner than on the outer half of the disc, that on the pygidium and under surface cinereous. Head densely, finely punctate; eyes large; antennae (♂) long, widening outward, joints 6–11 rather broad, 6–10 longer than wide, (♀) shorter, joints 6–10 about as long as broad. Prothorax about as long as broad, subcampanulate, strongly dilated posteriorly and narrow in front, densely, rugulose punctured, deeply bisinuate at the base. Elytra moderately long, rounded at the sides behind the humeri, separately rounded at the tip; sharply, finely striate, the striae impressed with conspicuous oval punctures which become much finer towards the apex, the interstices almost flat, densely, transversely rugulose. Pygidium large, densely punctulate. Under surface densely, minutely punctate. Posterior femora strongly elevata, armed with a minute tooth towards the apex beneath; anterior tibiae of ♂ bowed, that of ♀ feebly curved. Length $2\frac{1}{3}$ – $2\frac{1}{2}$, breadth $1\frac{1}{3}$ – $1\frac{1}{2}$ mm. (♂ ♀.)

Hab. INDIA, W. Almora in Kumaon (*H. G. C.*: v.1918).

Bred in abundance from the pods of *Lespedeza stenocarpa* (Order Leguminosae). The brilliant shining blue surface of this small Bruchid separates it from all the described Indian members of the genus, and indeed from all those known to me from other parts of the world, metallic coloration being rarely met with in this family of beetles. The females vary in the colour of the pygidium and of the terminal ventral segments of the abdomen, some specimens having these parts of the body metallic as in ♂, and others have them rufous. The males are constant in this respect, but the antennae in this sex are sometimes almost wholly testaceous. A metallic green parasitic Chalcid (*Entedus* sp.?) was bred in some numbers from the same pods.

Bruchus maculipyga, n. sp.

Elliptic, much narrowed in front and behind, convex beneath; shining, reddish-brown, the upper surface more or less nigro-variegate (especially towards the sides, suture, and apex of the elytra), the pygidium with a large rounded black patch on the apical half, sometimes divided down the middle, and usually continued forwards to the base, becoming gradually wider anteriorly, antennae testaceous, joints 6–11 often more or less infuscate (especially in specimens assumed to be males); palpi and eyes black; legs testaceous or obscure testaceous, with the tips of the tarsal joints 3 and 4 black; thickly clothed with a fine adpressed vestiture, which in the paler examples is almost wholly tawny on the prothorax and elytra, that on the darker specimens partly partaking of the ground-colour, these latter with numerous small, oblong or subquadrate, cinereous and black spots; the black patch on the pygidium

bordered by a sinuous whitish line or patch (which often encloses a small dark spot), the vestiture of the under surface and legs brownish white, the anterior portion of the broad pygidial stripe sometimes fulvous. Head densely, finely punctate; antennae rather short, still shorter in ♀, the joints 6-10 transverse, moderately broad. Prothorax convex, broader than long, rapidly, arcuately narrowing from the base forward; closely, conspicuously punctate, with very minute punctures intermixed. Elytra oval, comparatively short, flattened on the disc, strongly dilated inferiorly (as seen in profile) below the humeri; with finely punctured sharply-cut striae, the interstices densely, rugulose punctate. Pygidium very large, oval, densely rugulose, the sinuous inner edge of the whitish lateral patch disfiguring the true margin. Posterior femora broad, armed with a very minute tooth before the tip beneath; posterior tibiae compressed, stout, carinate, sharply toothed at the inner apical angle. Length 3½-4, breadth 2 mm.

Hab. INDIA, Dehra Dun (R. S. Hole).

Described from a long, variable series bred during July of the present year from seeds of *Acacia gagiana* sent to the Botanical Department of the British Museum. Dr. G. A. K. Marshall cannot identify this species with any of the numerous known Indian members of the group, and it is at his request the description has been drawn up by myself and included in the present paper. The sexes, if correctly identified by me, differ in the length and colour of the antennae, these organs being shorter and paler in the supposed females. The long pygidium, with a broad, mesially constricted, white-bordered, black stripe, is a conspicuous feature in the present insect.

Horsell.

August 22nd, 1919.

NEW BARK-BEETLES FROM THE NEIGHBOURHOOD OF
VLADIVOSTOK (EAST SIBERIA).

BY PAUL SPESSIVTSEV (SPESSIWZEFF),

Assistant Entomologist in former Imperial Forest Institute, Petrograd.

(PLATES XV, XVI.)

Eccoptogaster jacobsoni, sp. n.

Length 3·8-4·5 mm. Dark brown, with the elytra and legs lighter; antennae reddish. *Front* compressed in the male, clothed with yellow hairs, which are less dense in the middle and are somewhat inclined towards the centre; convex in female, impressed over the mouth, and almost glabrous; the vertex in female with a median impressed line. *Pronotum* a little broader than long (7:6); the punctures rather fine on the dorsal area, becoming coarser and separate one from another on the anterior and lateral areas; the puncturation resembles in general that of *Eccoptogaster ratzeburgi* Jans., but is visibly coarser. *Elytra* bright, about as long as wide (15:14), with almost parallel lateral

margins; striae round, striae impressed; interspacial punctures considerably finer than those of the striae; 1st interspace with two irregular rows of punctures; 2nd, 3rd, and 4th interspaces each with usually one row of punctures, here and there impressed. *Abdomen* concave, covered with very short and sparse erect hairs in both sexes; in the male the 3rd segment with a horizontal median finger-shaped process on apical margin, the 4th segment with a faint median tubercle on apical margin (fig. 1); in the female the 3rd and 4th segments are simple.

The *proventriculus* (fig. 2) resembles that of *Eccoptogaster ratzeburgi* Jans.; the anterior part of the proventricular plate (*a*) is covered with sharp cone-shaped teeth, which are brown in colour and especially stout on the parts adjacent to the medial margins; the terminal parts of the apical laminate teeth (*b*) are deeply and sharply splintered.

Chitinous parts of the male organ of reproduction (fig. 3) distinguished by the following characters. The body (*a*) is canoe-shaped, with acuminate apical end; the lateral folds (*b*) do not touch one another; the body-apodemes (femora) (*c*) cross each other and are as long as the body itself; the hood-shaped terminal plate (*d*) is rather solidly chitinous; from under this plate protrudes the praeputial sac (not indicated on the figure), the laminated coat of which is provided with very fine chitinous teeth.

The type of egg- and broad-galleries resembles that of *Eccoptogaster scolytus* Fabr.; the longitudinal egg-gallery has a slightly widened entrance chamber at base and lies on the inside superficies of the bark, without touching the wood; the egg-gallery in question is 30 mm. long and 2·5 mm. wide; from each side of this gallery thirty close broad-galleries diverge, these latter not cutting into the wood but just touching it; each broad-gallery is nearly three times as long as the egg-gallery.

Ten specimens and one block with but one well-developed gallery. Under the bark of *Ulmus* sp., Vladivostok, 1915, Mr. B. Berger, collector.

The name of this new species is given in honour of the eminent Russian Coleopterist Mr. G. G. Jacobson.

Eccoptogaster semenovi, sp. n.

Length 1·7-2·2 mm. Body shining, dark brown; elytra, anterior and sometimes posterior margin of pronotum lighter; head, underside, and in mature specimens also the pronotum, almost black; coxa, apex of the femur, tibia, and tarsus reddish-brown. Front with long aciculate scratches from mouth to vertex; flattened in male and bordered with sparse but long and slightly curved hairs; in the female convex, almost glabrous, covered with sparse, fine, scarcely visible hairs. Pronotum as long as broad, with sides nearly parallel at the base, then regularly rounded in front; dorsal area covered with fine slightly oval punctures, which become rounder, coarser, and separate one from another on the lateral areas. Elytra as wide as pronotum, with the sides parallel in the basal half, then narrowed towards the apex; the length compared to the width is as 5:4; striae punctures slightly elongated; the interspaces each with a row of punctures, considerably finer than those of

the striae; surface glabrous, the apical part only clothed with sparse, erect hairs; external apical angles with visible serration. *Abdomen* concave; the almost vertical 2nd segment in both sexes with a short obtuse process, which is flattened at sides and placed at some distance from the basal margin of this segment; in the male the apical margin of the 4th segment is thickened in the middle; the abdominal segments of the male are clothed with very fine erect hairs, more or less evident around the outer area, but very sparse in the centre; in the female these hairs are equally placed, curved at the ends, and much longer than those of the male. The hind tibiae are provided with long scattered hairs in both sexes.

Proventriculus small and faint. Proventricular plate (fig. 4) provided with tubercle-like obtuse teeth, which become transparent, fine, and sharp on the under part of the plate; all these teeth are placed in more or less regular transverse rows; the laminate teeth (*b*) are not numerous and their margins are simple.

The organ of reproduction of the male (fig. 5) is of a very peculiar form owing to its asymmetry. One of the lateral folds (*b*) is more developed than the other: the terminal plate (*d*) lies asymmetrical to the body of the organ, and is in the form of a curved tube, the widened base of which is provided with a closed caviform process (*d'*); this process is divided in two branches, one of which is considerably shorter than the other; the apex of the terminal plate is widened into a funnel, clothed with a glabrous lamina, which may be considered to be a praeputial coat.

Under the bark of *Ulmus* sp. The longitudinal egg-galleries usually begin with a widened entrance-chamber; the majority of the galleries are 10–12 mm. long: the longest one is 20 mm. and the shortest 5 mm. long; the broad-galleries are nearly four times as long as the egg-galleries; they lie at first perpendicularly to the egg-gallery, then take mostly a longitudinal direction. Both the egg- and broad-galleries are equally but very superficially engraved in the wood.

Twenty-one specimens and two trunks with several galleries. Neighbourhood of Vladivostok, 1915, Mr. B. Berger, collector; Manchuria, 1916, Mr. V. Verbicky, collector.

I name this species in honour of Mr. A. Semenov, the well-known Russian Entomologist, President of the Russian Entomological Society and Honorary Fellow of the Entomological Society of London.

Hylesinus eos, sp. n.

Length 2·25–3 mm. In size and shape and in colour of elytral vestiture resembling *Hylesinus fraxini* Panz., but distinguished by the following characters: (1) front in the male impressed, in the female somewhat concave; (2) pronotum dull and dark, almost glabrous, without scales, sparsely covered with short downy, yellowish-grey hairs, which become denser and longer on the posterior area; (3) interspaces 1st, 3rd, and 9th of the elytral declivity somewhat elevated, the 2nd impressed; (4) interspaces 1st, 3rd, 5th, 7th, and

9th each provided with a row of very fine tubercles, perceptible only in rubbed specimens, the 2nd, 4th, 6th, and 8th without tuberculation. Other morphological characters as in *Hylesinus fraxini* Panz.

Under the bark of *Fraxinus manshurica* Rupr. and *Juglans manshurica* Max. The galleries resemble those of *H. fraxini*: the egg-gallery transverse and double, the larval galleries a little shorter and not so close.

Vicinity of Vladivostok, 1912, 1915, Messrs. A. Czerski, N. Delle, B. Berger; Manchuria, 1916, Mr. V. Verbicky.

Xylechinus bergeri, sp. n.

Length 1·6-1·8 mm. Head black, finely granulated and densely punctured; front with distinct carina, covered with rather short yellowish hairs, which are a little longer at the sides and considerably longer above the mouth; antennae reddish-brown, club darker, funicle 5-jointed. Pronotum dark brown, as broad as long, widest in the middle, from above nearly round, without distinct elevated median line, closely punctured, the rather deep punctures bearing small yellowish-brown scales or scale-like bristles, declining towards an imaginary median line. Elytra brown, more than twice as long as wide, with regular rows of round punctures; interspaces flat, equally and rather sparsely covered with small punctures, which bear very small, separate, rounded, yellowish-brown scales, those on the 1st interspace along the suture longer and more closely placed; besides these rounded scales, each interspace is furnished with a regular row of erect and rather long bristles, contrasting on the dark elytra and their brown scales by their bright yellow colour. Underside black, legs dark brown, knees and tarsi brown.

As to the internal anatomy, the proventricular plate is characterized by its smooth edged, not serrated, closing bristles; and the male reproductive organs by having the thin spicule bent in two places (fig. 6 A).

Under the bark of the branches of *Phellodendron amurense* Rupr. The galleries suggest those of *Xylechinus pilosus* Knoch: egg-tunnels mostly transverse, often with a widening in the middle; larval mines very confused (fig. 7). Vladivostok, 1915, Mr. B. Berger, collector.

Hylastinus (? *Hylastinoides*, subgen. n.) *alni* Niisima.*

Length 3·2 mm. Head black, finely granulated, with separate punctures; front with irregular, somewhat wavy surface, sparsely covered with short yellowish hairs; antennae reddish-brown, funicle 7-jointed, club conical, with 6 distinct setaceous annulations and with chitinous 2nd and 4th sutures (fig. 8 A). Pronotum wider than long (4 : 3), black, sparsely covered with very fine, downy, yellowish-grey hairs, finely granulated, with shallow punctures, some of which are coalescent; anterior and median sections of the lateral areas

* Japanese specimens described by Prof. Y. Niisima as *Hylastes alni* (Niisima, Y., "Die Scolytiden Hokkaidos unter Berücksichtigung ihrer Bedeutung für Forstschaden," Journal of the College of Agriculture, Tohoku Imperial University, Sapporo, Japan, vol. iii, part 2, 1909, p. 137) correspond to those found in Vladivostok. Our more detailed description shows that the examples from Vladivostok do not belong to genus *Hylastes* Erichs.

armed with scattered, but very well developed tooth-like tubercles. *Elytra* dark brown, longer than wide (3 : 2), wider than pronotum, and a little broader behind the middle than at base; their anterior and median areas glabrous, the declivity clothed with very fine yellowish-brown scales; the striae deeply impressed, narrow, interspaces wide and convex on the posterior half; all the interspaces transversely rugose, the rugosities finer towards declivity and changing there into very fine, densely-placed punctures; on the declivity the interspaces 1st, 3rd, 5th, 7th, and 9th, as well as the apical margin, are armed with rather strong tubercles and also somewhat elevated, the 3rd and 9th conjoined, 5th and 7th separate and shortened (fig. 9). *Underside* almost black, covered with downy, simple, and barbed hairs; episternum and epimerum densely clothed with silvery-white, barbed scales. Legs dark brown with reddish-brown knees and tarsi.

The undivided anterior proventricular plate (fig. 10, A, I) well chitinized on both sides between 1 and 9-10 parallel rows (*a*), the first 5 rows continuous and unserrated, the first situated in the middle, the ribs of the slope on the posterior plate (II) slightly serrated on upper part of the plate (*b*).

Certain characters of this species do not correspond exactly with those of the genus *Hylastinus* Bedel *: more thorough examinations are wanted; in a preliminary manner it can be placed under a new subgenus, *Hylastinoides*.

Vicinity of Vladivostok, 1915; 3 specimens † under the bark of *Alnus* sp.; Mr. N. Delle, collector.

Myelophilus pilifer, sp. n.

Length 3·6 mm. Allied to *Myelophilus minor* Hart., but distinguished by the following characters: (1) interspaces of the basal half of the elytra provided with rugosities; (2) interspatial punctures dense and nearly as large as those of the striae; (3) in addition to the erect hairs arising from the bases of the interspatial tubercles, there are fine, declining reddish hairs on the interspatial punctures (fig. 11 A); (4) galleries resembling those of *M. piniperda* L.: egg-tunnel longitudinal, but larval galleries considerably shorter than those of *M. piniperda* L.

From *M. puebellus* Reitt. this species differs in having erect hairs on the elytral interspaces and tubercles on the 2nd interspace on the declivity.

Under the bark of *Pinus koraiensis* Sieb and Zucc. Vladivostok, 1915, B. Berger, collector.

EXPLANATION OF PLATES.

PLATE XV.

Fig. 1. *Eccoptogaster jacobsoni*, sp. n. Abdomen.

2. " " " " Proventricular plate: *a*, anterior plate; *b*, posterior plate, with apical laminate teeth.

* Bedel, L., "Fauna de Coléoptères du bassin de la Seine," Ann. Soc. Ent. France, 1888, p. 388; Nüsslin, O., "Zur Phylogenie und Systematik der einheimischen Hylesiniden," Naturw. Zeitschr. f. Forst- u. Landw., 1912, pp. 267-289; Fuchs, G., "Morphologische Studien über Borkenkäfer II., Die europäischen Hylesiniden," München, 1912.

† One of these specimens, much damaged and without abdomen, was used for the examination of the proventriculus.

3. *Ecoptogaster jacobsoni*, sp. n. Chitinous parts of the ♂ organ of reproduction: *a*, body of the organ; *b*, lateral folds of the same; *c*, body-apodemes (femora); *d*, terminal plate; *e*, tegmen; *f*, spicule.
4. " *semenovi*, sp. n. Proventricular plate: *a*, anterior plate; *b*, apical laminate teeth.
5. " " " Chitinous parts of the ♂ organ of reproduction: *a*, body of the organ; *b*, lateral folds of the same; *c*, body-apodemes (femora); *d*, terminal plate; *e*, tegmen; *f*, spicule.
- 6 A. *Xylechinus bergeri*, sp. n. Spicule.
- 6 B. " *pilosus*, Ratz. Spicule.

PLATE XVI.

Fig. 7. *Xylechinus bergeri*. Galleries.

- 8 A. *Hylastinoides alni* Niisima. Antenna.
- 8 B. *Hylastinus funkhauseri* Reitt. Antenna.
9. *Hylastinoides alni* Niisima. Elytral declivity.
- 10 A. " " " Proventricular plate: I, divided anterior plate; II, posterior or masticatory plate: *a*, chitinous part of anterior plate; *b*, serrated ribs of the slope; *c*, closing bristles; *d*, masticatory brush.

10 B. *Hylastinus funkhauseri* Reitt. Proventricular plate: lettering as in 10 A.

11 A. *Myelophilus pilifer*, sp. n. Elytral interspaces.

11 B. $\left\{ \begin{array}{ll} " & \text{minor Hart.} \\ " & \text{piniperda L.} \end{array} \right.$ " "

Rovakko (Golzin hovi), Pyhäjärvi, Vp. I., Finland.

September 3rd, 1919.

NEW SPECIES OF STAPHYLINIDAE FROM CEYLON.—PART I.

BY MALCOLM CAMERON, M.B., R.N., F.E.S.

(Concluded from p. 228.)

Medon (s. str.) *championi*, n. sp.

Rufous, moderately shining, the elytra rufo-testaceous, with a broad, transverse, indeterminate pitchy-brown fascia; abdomen pitchy-red, the posterior margin of the 7th or whole of the 8th dorsal segment reddish-testaceous; antennae and legs reddish. Length 4 mm. Head transverse, subquadrate, the eyes moderately large, the temples briefly rounded, rather coarsely and closely punctured, the interspaces shining and without ground-sculpture. Antennae with the 3rd joint slightly longer than the 2nd, the 4th and 5th a

little longer than broad, 7th and 8th moniliform, 9th and 10th somewhat transverse, 11th conical. Thorax as broad as the head, one-sixth broader than long, the sides nearly straight, gradually converging behind to the rounded posterior angles; disc before the scutellum with a short raised smooth line, lightly impressed on either side; puncturation finer than that of the head; pubescence scanty, yellowish. Elytra a little broader than, and fully half as long again as the thorax, longer than broad, with a broad ill-defined pitchy fascia across the disc, leaving the base narrowly and the posterior margin more broadly reddish-testaceous; puncturation as coarse and close as on the thorax, but more superficial; pubescence yellow, moderate. Abdomen moderately coarsely and pretty closely punctured anteriorly, much more finely so posteriorly, somewhat closely covered with yellowish pubescence throughout.

Hab. Balangoda, alt. 1770 feet (*G. Lewis*).

Medon basalis, n. sp.

Red, shining, the elytra reddish-testaceous, the posterior half black, the abdomen reddish-brown; antennae and legs reddish-testaceous. Length 4 mm. Allied to *M. brunnneus* Er., but with the head and thorax broader, the antennae shorter, and the elytra differently coloured. Head large, transversely quadrate, the eyes small, the base emarginate, the temples rounded; puncturation coarse, close, obsoletely umbilicate in front, less coarse and more obsolete posteriorly and on the temples, the interspaces without ground-sculpture. Antennae with the 3rd joint a little longer than the 2nd, 4th, 5th and 6th longer than broad, gradually decreasing in length, 7th and 8th as long as broad, 9th and 10th scarcely transverse. Thorax a little narrower than the head, somewhat transverse, the anterior angles briefly rounded, the sides gradually convergent backwards to the broadly rounded posterior angles; disc with a fine impressed median line throughout; puncturation coarse and close, as on the front of the head, obsoletely umbilicate; pubescence scanty. Elytra a little longer and broader than the thorax, longer than broad, the anterior half reddish-testaceous, the posterior portion black, without, however, a definite line of demarcation; puncturation moderately coarse, but superficial and rather close, pubescence scanty. Abdomen reddish, moderately finely and somewhat closely punctured anteriorly, more sparingly so posteriorly; pubescence yellowish, moderate.

♂. 7th ventral segment with a deep acutely triangular excision.

Hab. Dikoya, alt. 3800–4200 feet (*G. Lewis*).

Neobisnius rufipennis, n. sp.

Black, shining, the elytra red; antennae brown, the first two joints testaceous; legs testaceous, the intermediate and posterior tibiae, and sometimes the femora, a little infuscate. Length 4·75–5 mm. Head black, shining, almost square, the eyes moderately large, their diameter considerably less than the length of the temples, which are rounded posteriorly; the front and a broad space extending the length of the vertex impunctate, the rest of the upper surface with large scattered punctures, the temples finely and sparingly punctured; pubescence yellow, rather long and scanty. Antennae with the 2nd joint shorter than the 3rd, the 4th slightly longer than broad, the 5th to

the 7th as long as broad, the 8th to the 10th scarcely transverse, 11th oval. Thorax narrower than the head, a little longer than broad, the anterior angles obtuse, the sides gradually convergent to the rounded posterior angles; disc with a broad impunctate median space throughout and externally with large and scattered puncturation; pubescence scanty and moderately long. Elytra red, as long as but broader than the thorax, longer than broad; puncturation fine, by no means close; pubescence scanty, moderately long. Abdomen elongate, black, the apex pitchy, the bases of the first four visible segments especially, coarsely and closely punetured, more finely and sparingly punctured posteriorly; pubescence moderately long and scanty.

Hab. Nuwera Eliya, alt. 6230–8000 feet (*G. Lewis*).

Philonthus tripunctatus, n. sp.

Black, shining, the elytra aeneous-bronze, the abdomen iridescent; thorax with dorsal series of three punctures. Length 10 mm. Very closely allied to *P. bipunctatus* Bernh., but differing in the following respects: the more strongly transverse penultimate joints of the antennae, which are nearly twice as broad as long; the rather broader thorax, the disc of which carries three rather small punctures; and the more finely punctured abdomen and less finely punctured elytra. Head transverse, subquadrate, the median intra-ocular punctures much further apart from one another than from the lateral ones; the eyes large, their diameter much greater than the length of the temples; post-ocular punctures three in number, and a single puncture on either side at the base. Antennae black, the 1st joint pitchy beneath, the 2nd and 3rd joints of equal length, the 4th as long as broad, the 5th to the 10th transverse, gradually increasing in breadth, the penultimate nearly twice as broad as long, the 11th short. Thorax broader than the head, about as long as broad, the sides rounded in front, a little sinuated behind the middle; disc with a row of three rather small punctures—one on the anterior margin, the 2nd and 3rd separated by a space of the same length as that between the 1st and 2nd, the 3rd situated a little before the middle of the thorax; externally with two small obliquely placed punctures close together, and one or two near the anterior angles. Scutellum rather coarsely and closely punctured. Elytra as long as and a little broader than the thorax, transverse, shining, obscure bronze-green, moderately finely and somewhat closely punctured, but not so finely as in *P. bipunctatus*; pubescence short and scanty. Abdomen parallel, black, iridescent, but less so than in *P. bipunctatus*, and more finely punctured throughout than in that species, finely and not very closely pubescent. Legs black, the femora dark pitchy, the first joint of the posterior tarsi as long as the last; anterior tarsi strongly dilated in ♂, slightly in ♀.

♂. 6th ventral segment with acute triangular emargination; 5th ventral segment with a small rounded emargination.

Hab. Dikoya, alt. 3800–4200 feet (*G. Lewis*).

Philonthus pubipennis, n. sp.

Black, shining, elytra pitchy, very obscurely greenish-bronze; thorax with dorsal row of three punctures, the first small, the following larger; antennae

black, the legs pitchy. Length 12 mm. Build of *P. cinctulus* Gr., but the thorax a little broader, the antennae longer and entirely dark, the elytra more finely punctured and more obscurely coloured, the abdomen without iridescence and more finely punctured. Head large, transversely subquadrate, as broad as the thorax, with the median intra-ocular punctures widely separated, and seven or eight large punctures behind the eyes, which are large but not prominent. Antennae with the 3rd joint a little longer than the 2nd, the 4th scarcely longer than broad, the 5th to the 10th as long as broad and not increasing in breadth. Thorax scarcely transverse, the sides nearly straight in front, a little narrowed and slightly sinuate posteriorly; disc with a row of three punctures on either side, the first small and on the anterior margin, the second and third larger, the latter situated well before the middle; the sides with three punctures, and near the anterior angles are two or three others. Scutellum pretty closely and asperately punctured. Elytra as long as and a little broader than the thorax, scarcely transverse, rather finely and pretty closely punctured, with a fine, rather close, brownish pubescence. Abdomen parallel, entirely black, without trace of iridescence, very finely and moderately closely punctured and pubescent throughout. Anterior tarsi dilated in ♂ (♀ unknown); the first joint of the posterior tarsi as long as the last.

♂. 6th ventral segment with rather deep nearly semicircular excision.

Hab. Kitulgalle, alt. 1700 feet (*G. Lewis*).

Philonthus versicolor, n. sp.

Black, shining, abdomen strongly iridescent; thorax multipunctate on either side; antennae black, the first joint pitchy-testaceous beneath; legs testaceous, the anterior coxae pitchy, tibiae a little infuseate. Length 9 mm. This species would appear from the description given to be very closely allied to *P. eustibus* Er., but to differ in the following respects: the 1st joint of the antennae only is pitchy beneath and the abdominal segments are not reddish at the margins. Head transverse, suborbicular, the eyes large, their diameter much greater than the length of the temples, median intra-ocular punctures wanting, the series represented by a single juxto-ocular puncture on either side; posteriorly with three or four large punctures in the vicinity of the eyes. Antennae with the 3rd joint a little longer than the 2nd, the 4th to the 10th all distinctly longer than broad and scarcely differing in length or breadth, the 11th as long as the preceding. Thorax a little broader than the head, about as long as broad, the sides almost parallel, the posterior angles broadly rounded; the disc on either side of the middle with a somewhat irregular row of ten or eleven punctures, external to this the sides are very sparingly and more finely punctured. Scutellum finely and closely punctured and pubescent. Elytra scarcely longer but a little broader than the thorax, slightly transverse, pretty closely and finely punctured and finely but distinctly pubescent. Abdomen gradually narrowed behind, strongly iridescent, finely and sparingly punctured, pubescence rather long and sparing. First joint of the posterior tarsi longer than the last; anterior tarsi simple in ♀ [♂ unknown].

Hab. CEYLON, district not stated.

Conosoma montanum, n. sp.

Red, shining; antennae and legs testaceous, the former filiform. Length 4·5 mm. Build of *C. inuanedatum* Steph., but larger and differently coloured the antennae long and filiform; rather more obsoletely punctured and less pubescent. Antennae with the 3rd joint a little longer than the 2nd, the 4th to the 10th all much longer than broad but gradually decreasing in length, the 11th as long as the preceding.

Hab. Dikoya, alt. 3800–4200 feet (*G. Lewis*).

BALKAN BUTTERFLIES.

BY HERBERT MACE.

Although there is a bright display of butterflies during the summer, two years' collecting in the Balkans produced a much poorer crop of species than I had expected. As a matter of fact, five species which were extremely abundant, brightly coloured, and conspicuous, accounted for the display. These were the "Painted Lady," the "Clouded Yellow," the "Bath White," and the two "Swallow-tails."

Comparatively little freedom from military restriction was obtainable during the campaign, or I might have secured a greater number of species, for the country is so broken up into more or less isolated ravines that an insect might be plentiful only a short distance from the places one was able to visit.

Macedonia being at the opposite end of Europe, some comparison between its species and those of Britain is interesting. Of thirty-six species which are common in Britain, only fourteen are abundant in Macedonia; and of thirty-four species which I found common in Macedonia, twenty-one are absent or very rare in Britain.

In the *Nymphalidae* a curious feature is the absence of *V. urticae*, accounted for by the scarcity of the common nettle; and in the genus *Argynnus*, notoriously local insects, there appears to be a total difference in the species, not one of those I found being known (except *lathonia* very rarely) in Britain.

Five of our British species, though common in Macedonia, appear as a distinct local race. These are *S. megaera*, *C. pamphilus*, *L. phlaeas*, *P. astrarche*, and *A. thaumas*.

Another feature I noticed was the occurrence of extremely dwarf forms of several species, similar to those produced from time to time among bred specimens, which is, I believe, accounted for by malnutrition

of the larva owing to unsuitable or inadequate food, and it is possibly the case that in such a dry climate a certain number of larvae are obliged to subsist on food of less succulence than ordinary.

Papilio podalirius was generally distributed, but found only in ravines where there was a perennial stream. It has a lofty, sailing flight and the eggs are deposited high in the pear-trees.

P. machaon abounded especially on dry hillsides, a curious circumstance when one considers its habitat in England. My specimens are paler than British ones and are much less heavily marked.

Thaïs hypermnestra.—An early species, on the wing from March to May. Very local and of short duration.

Aporia crataegi.—Abundant in May and much the commonest "white" while it lasted. On one occasion I saw twenty-five congregated on a patch of damp sand and several of these were spotted with pink, presumably from some liquid which had been spilt over them.

Pieris brassicae.—Not common. I saw one as early as February 4th. One male has the discal spots beneath much larger than normal and connected by a narrow band, the lower spot extending to the hind margin, and near the costa is a small double spot, the whole arrangement suggesting a broken band across the wing.

P. rapae.—Moderately common, but not nearly so abundant as in England. Specimens much smaller than British. Earliest date the second week in March.

P. napi.—Scarce. My specimens are all faintly marked and suggest a transitional form between this and the last.

Pontia daplidice.—Abundant throughout the season, the later brood, appearing about July, being most profuse.

Euchloe ausonia.—The only "Orange tip" I saw, and that sparingly.

Colias hyale.—Common from April to November. Prefers the plains and is not so strong on the wing as the next species.

C. edusa.—Extremely abundant from the second week in March to the end of November, fresh specimens appearing about the end of June.

The var. *helice* moderately frequent.

Argynnis maria.—The most striking butterfly I met with in the Balkans. In the autumn it was very abundant in a ravine near Janes, and the following May it was in even greater profusion at the same place. Unlike *paphia*, this is not at all strong on the wing, its flight being heavy and it settles frequently. On a certain clump of acacias I found numbers resting with closed wings on the under side of the leaves, where the soft green of the under surface proved strikingly protective. It is more gregarious than any other fritillary and, indeed, its habits are quite different from those one associates with the British fritillaries.

A. lathonia.—Abundant from March to June. Much addicted to tracks, like the "Wall," which it much resembles on the wing.

Melitaea didyma.—Local, but abundant where it occurs, from the middle of May to June.

M. trivia.—One specimen only, flying with *didyma*.

M. phoebe.—Abundant in ravines from the end of April to June.

Polygonia C-album.—One specimen only; March.

Vanessa polychloros.—One only; April.

V. io.—Only seen twice; March and June.

Pyrameis atlanta.—In a ruined village where I was on duty for several months this butterfly was very common, sailing to and fro in the gardens in the fearless friendly way one associates with the insect. It was on the wing till December, when it went into hibernation, although the weather was still mild and open. It appeared again in March.

P. cardui.—The most abundant of all Macedonian butterflies. In the autumn of 1918 I found hundreds round a barley stack. Presumably they had gone there to roost, but the numbers upon and flying round the stack were uncountable.

Satyrus megaera.—Moderately common from April to October. All the specimens I examined were of the var. *lyssa* with grey hindwings. Another noticeable difference is that the subsidiary eye near the tip, which is only a small spot in the type, is clearly pupilled in the var., and the eyes on the hindwings beneath are larger and more distinct.

Coenonympha pamphilus.—Abundant from April to November. All of the var. *lytta*, which are larger, the apical spot is more distinct and there is a submarginal row of small spots on the hindwings.

Hipparchia briseis.—Not very common, but seen occasionally in June and again in autumn. I found it only in the roughest and stoniest hollows, and it was hard to capture, being strong on the wing.

Epinephele lycanon.—I may have overlooked this, the male being very like *jurtina*, but I have only one specimen, a female taken near Lake Doiran in September.

E. jurtina.—Abundant from May to September. In one ravine I found a number of curious forms, darker than normal, but with much albinism, especially round the outer margins of the hindwings. There was also a good deal of distortion, the affected wings being often crumpled and shortened.

Melanargia larissa.—The only "Marbled White" taken. A few only seen flying over reeds near the Spanc River in May. Much stronger on the wing than the British species.

Thecla acaciae.—A few fresh specimens found flying round a vetch in May.

T. rubi.—One specimen only; April.

Lyaena thersamon.—Extremely abundant on Janes Plain, but elsewhere I only met two isolated specimens—one near Kasimli in July, the other on the banks of the Ardjan in August. At Janes it was abundant during August and September, and in 1918 the first brood appeared in the first week of May,

continuing to the end of June. It was addicted to the blossoms of heliotrope, and it was a charming sight to see several pairs flying round and settling upon this plant, the intense colour of their wings forming a striking contrast to the white of the flowers. I took several specimens of the var. *omphale*, which are smaller, yellower, and have longer tails.

L. phlaeas.—Differed both in form and habit from the British *phlaeas*, all being heavily suffused with greenish black, slightly larger, and the tails at the outer angle are long and prominent. I did not find this species much in open country, but in sheltered ravines and brambly passages between rocks it was in great profusion.

Polyommatus telicanus.—Only found by the banks of streams and in the immediate vicinity of its foodplant, the Purple Loosestrife, round which there were often scores to be seen. Very inconspicuous and swift in flight. The most elusive "blue" I have met with.

P. argus.—Common in June and July, flying round the *Polygonum rumicis*.

P. astrarche.—Smaller than British. The red spots are brighter, more uniform, and extend quite to the costa. The pupils of the eyes are also larger than in British specimens. Common in ravines in April and May.

P. icarus.—Abundant in the usual habitats from April to September. One afternoon I observed a congregation of thousands in a cave-like opening in a ravine. Variation much as usual, but no blue females seen.

P. cyllarus.—Three specimens only. Flies in bare rocky places in April.

P. argiolus.—Common where ivy occurs, appearing as early as March.

Spilothrys alceae.—The commonest skipper, flying freely over the plains and visiting thistles and centaureas. I also found a good many at the loosestrife in company with *P. telicanus*; July and August.

S. altheae.—Not so common as the last, but of similar habits. I have a note of its appearance in April.

Hesperia sidae.—One specimen only, taken in a ravine in May.

H. malvae.—Common on hillsides in April and May. Blacker than British, and the submarginal band very indistinct. A very variable species, which appears to merge imperceptibly into its allies.

H. orbifer.—On the wing a little later than *malvae*, but frequents similar situations.

Adopaea thaumas.—Common in ravines as early as May and not long on the wing. There is a decided difference between Macedonian and British forms. All the former are distinctly larger and the colour is brighter orange. The underside is more uniformly fulvous orange, and I have one example in which the lower surface of both wings is wholly of that colour.

Faircotes, Harlow.

October, 1919.

Coleoptera at the Lizard, Cornwall.—During a fortnight (from June 6th last onwards) spent at the Lizard in quest of *Coleoptera* I had the gratification of securing a considerable number of the rare Dytiscid, **Agabus brunneus* F. They occurred in gravelly little pools in the bed of a deep, drain-like rivulet. In consequence of the drought of the previous weeks no water was flowing, and the prostrate drying water-plants showed that none had passed over them for many days. Notwithstanding this advantage for the beetle-hunter, the narrowness of the channel, with its steep sides rising in places almost upright for three feet or more, made collecting rather difficult. Moreover, the water-course was rocky and thickly strewn with large stones which had to be thrown out in order to work at the pools, whilst boulders demanding at least a crowbar to shift them now and again blocked the way. Shingle, rocks, and stones were all harsh and angular, and my water-net, although small and very strong, needed extensive repairs at the end of the hunt. Overhead, here and there, a luxuriant growth of heather and gorse from both sides overlapped in the middle and formed so effective a curtain that some clearance with the pocket-knife was needed to get light as well as room for movement. Hitherto I had sought for *A. brunneus* in streamlets well open to sunshine; it was therefore surprising to me to get it amidst such gloomy surroundings. Another good capture was that of *Miarus micros* Germ., of which I secured about sixty examples. It was apparently not attached to any particular plant. Several specimens occurred on species of *Crepis* and *Lotus*; and on a small detached cluster of *Armeria* I took upwards of twenty; yet on a large patch of the same flower, several yards in length, close by, not one was found. The insect was distributed all over the district, and as a rule was taken two or more at a time by general sweeping. My other captures include: *Harpalus tenebrosus* Dej., *H. serripes* Schönh. (and, whilst waiting at Helston, a specimen each of *Anisodactylus binotatus* F. and its var. *spurcaticornis* Dej. were taken in the road to Penrose), and a black form of *Amara ovata* F.

Although carefully looked for, *Staphylinidae* were conspicuously scarce, and traps of fur, feather, and sugar yielded common things only—and those very rarely. The moss in the rills seemed to be also barren of the tribe, the only species observed being the common *Stenus guttula* which leisurely stalked out now and then, excepting in one little waterfall, well above high-tide mark, where I secured a single example of **Lesteva fontinalis* Kies., and, to my surprise, from the weed of this absolutely fresh water several *Micralymma marinum* Stroem (*brevipenne* Gyll.) and *Atheta halobretha* Shp. were shaken—species not perhaps worth noting except for the unusual habitat.

Palpicornes were there in abundance, however; at Kynance *Ochthebius impressicollis* Lap. (*bicolon* Steph.) occurring in countless numbers, and with them a sprinkling of *O. impressus* Marsh. A single example of *Hydraena gracilis* Germ. also occurred, and was the one and only representative of the genus that I met with. At Caerthilian *Helophori* were found in myriads, but they are not yet determined.

Limnius troglodytes Gyll. also was in the streams, and in a grass trap three *Hyperaspis reppensis* Herbst were taken; **Heterotomus (Brachypterus) pulicarius* L. several, and **Meligethes subrugosus* Gyll. by sweeping; *Silpha obscura* L. fairly common on the paths, etc.; *Amphimallus (Rhizotrogus)*

ochraceus Knoch (several) flying in the sunshine, and *Cardiophorus erichsoni* Buys. (13) by sweeping long grass; *Cathormiocerus maritimus* Rye (12), **Trachyphloeus laticollis* Boh. (13), and *T. myrmecophilus* Seidl. (24) at roots of herbage; *Polydrusus chrysomela* Ol. one on Asparagus Island; *Barypitheca sulcifrons* Boh. (a few); *Sitones waterhousei* Walt. (one only); *Smicronyx jungermanniae* (18); **Amalus haemorrhous* Herbst (*scortillum*) (10); *Ceuthdarsoni* Bris. (abundant); *C. terminatus* Herbst (one); *C. nasturtii* Germ. (6); *Mecinus circulatus* Marsh. (one); **Sibinia sodalis* Germ. (three worn examples); **Tychius pusillus* Germ. (*pygmaeus* Bris.) (one); *Orthochaetes setiger* Beck (6); *O. insigilis* Aubé (2); *Cassida sanguinolenta* F. (1), and *C. nobilis* L. in abundance on *Silene*.

I am indebted to Mr. G. C. Champion and Mr. E. A. Newbery for kind help in determining critical species for me, and to Mr. N. Mickiewood for assistance in collecting. Names marked with an asterisk are, I believe, additions to the county list of Cornwall.—JAMES H. KEYS, 7 Whimple Street, Plymouth: October 10th, 1919.

Bagous intulosus in Glamorgan and Berks.—Dr. Sharp (Ent. Mo. Mag. 1917, p. 106) speaks of this as a rare species in Britain. It may therefore be worth while recording that I took several examples last Easter on the Llannadœe sandhills, Glamorganshire, in small "pockets," dug by rabbits. I have also a single one from Oxwich Bay in the same county. Last July Mr. P. Harwood discovered it in a fallow field at Barkham near Wokingham, and subsequently I took it there in numbers. The field had been ploughed and then allowed to go fallow, and water had evidently been standing in the furrows. When we visited the ground it was covered with a profusion of herbage, and the *Bagous* occurred under various plants with a marked preference for the roots of *Juncus bufonius*. Nearly all the beetles were unusually clean and "un-muddy."—J. R. LE B. TOMLIN, Reading: October 15th, 1919.

Platypus cylindrus in Worcestershire.—In October 1918, I found a large colony of this beetle in an oak root on the outskirts of the Wyre Forest. The burrows, of which there must have been some hundreds in the root, were continued through the earth which was still adhering in places, and as the beetles were at the mouth of the burrow there was no difficulty in obtaining specimens. The insects were still working in June of this year. This summer two or three examples have begun burrows in a walnut-log in my garden, but in no case do the burrows seem to have made much progress, and I have found two or three dead beetles just outside the entrance. Perhaps the wood is not as suitable as oak. In the same log are a number of colonies of *Xyleborus dryographus*, with here and there a burrow of *X. dispar*. Of the latter I found six or seven females, with one male, while of the former some sixty females were examined, with only one male. Apparently parasitic on *X. dryographus* were *Laemophloeus binaculatus* and *ferrugineus*. I was not able to trace the connection absolutely, but *L. binaculatus* was found only in the immediate neighbourhood of the burrows, which themselves were confined to a very small part of the log, just at the point where the bark was dying.

Other beetles found in the log were: *Anommatus 12-striatus* (under chips), *Rhizophagus politus* and *parallelocollis*; this latter is found abundantly all over the garden, probably from the churchyard adjoining. Some other species new to the district taken this season are: *Cryphalus tiliae*, bred from lime with *Stenostola ferrea*; *Cryphalus binodulus*, this must be common from the number of trees attacked, but is difficult to find; *Laemophloeus ater*, found in July always in pairs, on broom with *Phloeophthorus rhododactylus*; and *Orsodarna cerasi*, beaten from hawthorn, one specimen, apparently var. *glabrata*.—G. H. ASKE, Hartlebury, Kidderminster: October 12th, 1919.

Some Coleoptera taken on Dartmoor.—*Cicindela campestris* L. occurs sparingly in grassy places, and is the only member of the family taken. *Carabus catenulatus* Scop., *violaceus* L., and *nemoralis* Müll. were found sparingly under stones. The most interesting Carabid taken was *Panagaeus quadripustulatus* Stm. The Haliphiids include *Haliphus fulvus* F., *welwitschii* Gerh., *immaculatus* Gerh., and *variegatus* Stm. I might add that *H. ruficollis* De G. is abundant. Among the Dytiscids may be mentioned *D. marginalis* L. and *punctulatus* F.; *Deronectes 12-pustulatus* F. was found commonly in large pools and exhibits great variation. Staphylinids were not very common, *Oeypus alens* Müll. occurring at the edge of the moor very abundantly, and *O. morio* Grav. and *compressus* Marsh. sparingly under stones. Amongst the Silphids, most of the *Necrophori* occur, and I have taken *Necrodes littoralis* L., *Silpha thoracica* L., *rayosa* L., and *atrata* L. in similar localities. *Corynubites aeneus* L. was the most interesting Elaterid taken. The only Longicorns that could be said to occur at all commonly were *Strangalia armata* Hbst. and *Rhagium inquisitor* F. The most interesting xylophagous beetle taken was *Cerylon fagi* Bris., out of a decayed ash stamp. The Chrysomelid *Timarcha tenebricosa* L. occurs very commonly on the moor, and I have taken *Chrysomela banksi* L. and *goettingensis* L. sparingly. Rhynchophorids are not very abundant, *Apion minutum* Germ. and *Liophloeus nubilus* F. being the commonest. I am much indebted to Mr. Balfour-Browne and Dr. G. W. Nicholson for identifying specimens I have sent them.—E. J. PEARCE, The Lodge, Corpus Christi College, Cambridge: September 20th, 1919.

Notonecta halophila Edw. in Cornwall.—During August and September I found specimens of this *Notonecta* in that part of Cornwall between Wadebridge and Port Isaac. It appeared to be the principal species in the district, although I took one specimen of *N. furcata* F., two of *N. maculata* F., and one of *N. glauca* L. which was bred from a larva obtained from Polzeath, N. Cornwall. My best thanks are due to Mr. E. A. Butler for kindly confirming my identification. This note may be of interest as it seems that the distribution of *Notonecta* in this country is not so simple as is generally supposed. It appears that *N. glauca* L. may be absent from some districts, as my friend Mr. E. J. Pearce has sent me specimens of *N. maculata* F. and *N. furcata* F. from the Haytor district, Dartmoor, S. Devon. He failed, however, to obtain any *N. glauca* L. although he thinks he has noticed it there in former years.—G. E. HUTCHINSON, Aysthorpe, Newton Rd., Cambridge: Sept. 24th, 1919.

Aculeate Hymenoptera in the Channel Islands.—Mr. J. R. le B. Tomlin very kindly sent me any Hymenoptera he was able to box on flowers during a visit to Guernsey last June, and an examination of this material shows a few additions to the lists published in Ent. Mo. Mag. 1902, p. 140, and 1903, p. 245, and by Luff in Ent. Mo. Mag. 1907, p. 39. The following is a complete list of the species taken, an asterisk being placed against those which are apparently new records for the Islands:—

GUERNSEY.

**Iridomyrmex humilis* Mayr, one ♀ and one ♀. *Myrmica scabrinodis* Nyl., one ♀. *Tetramorium caespitum* L., one ♀ and several ♀ ♀. *Acanthomyops niger* L., four ♀ ♀; *A. alienus* Forst., two ♀ ♀. **Formica pratensis* Retz., abundant on herbage in Petit Bot Bay and nests on the cliffs between this locality and The Gouffre; *F. fusca* L., four ♀ ♀. *Tachysphex pectinipes* L., Moulin Huet, 28.6.19. *Philanthus triangulum* Fab., one ♂, L'Ancrese. *Cerceris rybyensis* L., Moulin Huet, 28.6.19, several. *Oxybelus uniglumis* L., several from Moulin Huet, 28.6.19, and The Gouffre, 27.6.19. *Crabro cribrarius* Fab., Moulin Huet, 28.6.19. *Crossocerus elongatulus* V. d. Lind., Moulin Huet, one ♂, 28.6.19. *Lindenius albularis* Fah., Moulin Huet, one ♂, 28.6.19. *Odynerus parietum* L., Moulin Huet, one ♂, 28.6.19; *O. pictus* Curt., Moulin Huet, one ♂, 28.6.19. *Hylaeus hyalinatus* Sm., Moulin Huet, one ♂, 28.6.19. *Sphecodes divisus* K. (*similis* Wesm.), The Gouffre, 27.6.19; *S. affinis* v. Hag., Moulin Huet, 28.6.19. *Halictus leucozonius* Schr., Moulin Huet, 28.6.19; *H. minutissimus* K., Moulin Huet, 28.6.19; *H. smethamnella* K., Moulin Huet, 28.6.19. *Andrena carbonaria* L. (*pilipes* Fab.), Moulin Huet, 28.6.19; *A. agilissima* Scop. (*flessae* Pz.), Moulin Huet, 28.6.19, and The Gouffre, 27.6.19; *A. flavipes* Pz. (*fulvicrus* K.), Moulin Huet, 28.6.19; *A. angustior* K., Moulin Huet, 28.6.19; *A. cingulata* Fab., Moulin Huet, several, 28.6.19; **A. saundersella* Perk., Moulin Huet, several, 28.6.19; **A. sp.*? Moulin Huet, 28.6.19, one specimen, very old and worn, which Dr. Perkins considers very close to *parvuloides* Perk., and possibly that species; *A. wilkella* K., Moulin Huet, 28.6.19. *Panurgus calcaratus* Scop., The Gouffre, 27.6.19; *P. ursinus* Gmel., The Gouffre, 27.6.19. *Nomada lineola* Panz., Moulin Huet, 28.6.19, including a ♂ of a colour variety not recorded for the British Isles; *N. flava* Panz. (*ruficornis* E. Saund. part.), Moulin Huet, 28.6.19. *Megachile muritima* K., Moulin Huet, 28.6.19.

SARK.

**Astata boops* Schr. **Odynerus reniformis* Gmel., one example, the yellow markings are more extensive than in British specimens. **Colletes daviesanus* Sm. **Hylaeus hyalinatus* Sm.

HERM.

**Halictus morio* Fab.

I am indebted to my friends Dr. R. C. L. Perkins and Mr. Horace Donisthorpe for kindly examining most of these specimens, and, in commenting on the Ants, the latter writes that the occurrence of *Iridomyrmex humilis*—the Argentine Ant—is of great importance, as it is a terrible pest and gets established very quickly.—H. M. HALLETT, 64 Westbourne Rd., Penarth : October 14th, 1919.

Obituary.

Through the death of *William E. Sharp*, which took place suddenly at Crowthorne, Berks, on May 20th, we have lost one of the best of our British Coleopterists. Sharp was born at Sparkbrook, near Birmingham, in 1856; when he was three years old, his father engaged in business in Liverpool, and the family removed to Oxton, Cheshire: subsequently he went to Birkenhead School, where he received a prize from the hands of Charles Kingsley, for whom he always had a great respect; from an early age he showed a taste for natural history—this and an artistic temperament he inherited from his mother. Dr. Pearce, the headmaster of Birkenhead School, was very anxious that he should go to Oxford or Cambridge, but he was prevented through lack of means, and joined his father's business. In 1883 he married Miss Katherine Green of Ledsham. For many years he was a member of the Lancashire and Cheshire Entomological Society, and in 1906 he published his valuable list of the Coleoptera of Lancashire and Cheshire. In 1899 he took up work in London and joined the Entomological Society, and made many friends. His health, however, broke down, and a few years ago he retired to Crowthorne. The district round Crowthorne, often known as the "Wellington College district" (the College being situated in the parish of Crowthorne), is one of the best collecting grounds in England, and the country with its undulating sweep of pine woods stretching for miles towards Hampshire and Surrey was a source of perpetual delight to him, both from an artistic (he made many water-colour sketches) and natural history point of view. The chief publication written by Mr. Sharp was a volume entitled "Common Beetles of the Country Side," an excellent piece of work, showing both great accuracy and considerable literary ability. He had a strong sense of the beautiful, and some of his descriptions of localities have a true poetic ring about them. We have already mentioned his Catalogue of Lancashire and Cheshire Coleoptera, and he was a valued contributor to the "Entomologist's Monthly Magazine"; two of his last contributions were on the Coleoptera of the Crowthorne district, and the habits of *Melanophila acuminata*, the "Fire-beetle," which appeared in great numbers in 1918 in places where the pine woods were being cut down and the stumps and refuse burnt.

The subject of our memoir was one of the kindest and most amiable of men; he was most generous and always ready to show his localities to any Coleopterist who desired information: one could not imagine his quarrelling with anyone for his one desire was to help. He had had great troubles throughout his life and met them all bravely, but there is no doubt that the death of his son in 1916 (he was shot by a sniper in France) did much finally to break his health. We will conclude with the following quotation from a letter from a Coleopterist well-known to most of us and who really ought to have written this notice; after speaking of his great ability as a Coleopterist and his lovable character, he continues:—"I have known him now for nearly a quarter of a century, have kept up regular and close correspondence with him, and have explored many parts of the kingdom in his company, and I can safely say that I have never had a better friend, and have never met a man whom I esteemed so warmly as Sharp." His collection of beetles has been purchased by the Liverpool Public Museum.—W. W. F.

Major Thomas Brom died on August 24th at Auckland, New Zealand. This veteran Coleopterist, for some time Government Entomologist of New Zealand, was well known by his writings to many workers in this country. We hope, when further particulars of his life are available, to give a more extended notice of his career. He must have described some thousands of species of beetles from that colony. A first set of his insects has, we believe, been bequeathed to the Nation.

Bruce F. Cummings died on October 22nd. He was on the entomological staff of the British Museum from 1912 to 1917, when he retired, owing to long continued ill-health. His entomological writings mainly related to *Anoplura* and *Mallopaga*. His work entitled "The Journal of a disappointed man," published under the pseudonym of W. N. P. Barbellion, appeared early in 1919. It has caused a certain amount of comment in the press.

NOTES ON THE COLEOPTERA OF BRITISH GUIANA.

BY G. E. BODKIN, B.A., DIP.AGRIC. (CANTAB.), F.Z.S., F.E.S.
Government Economic Biologist, British Guiana.

(Published by the permission of the Director of Science and Agriculture,
British Guiana.)

(Continued from p. 219.)

PTINIDAE.

Lasioderma serricorne Stephens.—One of the worst pests of stored, dried products in British Guiana. Plays havoc with leather, tobacco in all its forms, books, paper, biscuits, and other forms of dried foodstuffs. Carbon bisulphide is an effective remedy. Articles likely to be attacked must be stored in carefully constructed and well-fitting cupboards, boxes or cases. The interiors must be fumigated with carbon bisulphide at least twice a year and a plentiful supply of naphthaline or camphor must always be present.

BOSTRYCHIDAE.

Xylopsocus capucinus Fabr.—This species occurs also in Ceylon. Our specimen was obtained at the Penal Settlement, Mazaruni River.

TENEBRIONIDAE.

Zophobas confusus Geb.—Issororo, N.W.D.

Z. laticollis Mots.—Issororo, N.W.D.

Strongylium morbillosum Fabr.—Mazaruni R.

Uloma retusa Fabr., var. *bicolor* Kirsch.—Issororo, N.W.D.

Camararia clandestina Pasc.—Issororo, N.W.D.

Goniadera dissipata Kirsch.—Issororo, N.W.D.

Phobelius lucifugus Lacord.—Issororo, N.W.D.

A SYNOPSIS OF THE BRITISH SIPHONAPTERA, by the
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R. W. LLOYD, F.E.S. G. T. PORRITT, F.L.S.

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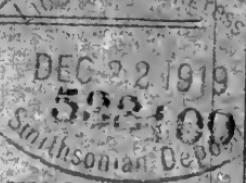
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Chingford Branch. The Chingford Local Branch meets at the Avenue Cafe, opposite Chingford Station, at 8 p.m., on the 2nd Monday in each month.

NILLIONIDAE.

Nilio villosus Fabr.—Tumatumari, Potaro.

N. pilosus Cast.—Issororo, N.W.D.

533 (69)

CISTELIDAE.

Allecula castaneipennis Champ.—Suddie, Essequibo.

CURCULIONIDAE.

Rhynchophorus palmarum Linn.—This beetle may be found all over British Guiana. The larvae may be discovered in decaying or diseased trunks of coconut palms, and the diseased or rotting stems and and rooting systems of sugar-cane. The adults are attracted to the odour of any decaying palm and will deposit their eggs therein. The larvae are not considered a gastronomic delicacy as they are in the Island of Trinidad (known there as "gru-gru" worms) and elsewhere, though they are occasionally eaten by the Aboriginal Indians of the country. About thirty years ago this insect was considered a pest of sugar-cane in the Colony, but it is seldom found as such in these days. Coconut palms in an advanced stage of "bud rot" are singled out for attack by this insect.

Rhina barbirostris Fabr.—Only occasionally met with. Attracted to artificial light. Widely distributed.

Metamasius hemipterus Linn.*—The commonest weevil, with the exception of *Calandra oryzae* Linn., in British Guiana. Invariably associated with sugar-cane, and may be found breeding therin either on the coastland plantations or in the sugar-cane patches of the Aboriginal Indian in the far interior. Very seldom attacks healthy strong-growing cane. On some estates this insect performs damage by attacking the cane "tops" when placed in the soil and thus destroying the "eyes" of the cane. Often found in canes attacked by fungus.

M. obsoletus Gyll.—East coas, Demerara.

Calandra oryzae Linn.—This cosmopolitan beetle occurs all over British Guiana and is responsible for the annual loss of many thousand dollars' worth of stored products.

Eustylus bodkini Mshll.—Issororo, N.W.D. Species described from specimens from British Guiana.

E. puber Olive.—Botanic Gardens, Georgetown.

* Det. Schwarz, U. S. National Museum.

- Amulactus nigritus* Gyll.—Skeldon, Courantyne coast.
- Atenistes attenuatus* Fabr.—Skeldon, Courantyne coast.
- Cleogonus rubetra* Fabr.—Onderneeming, Essequibo.
- C. conicollis* Rosenseh.—Ikuraka Lake, Essequibo.
- Cholus annulatus* Linn.—A common species on coastlands. There are many slight variations of the same species.
- Cylindrocorynus dentipes* Boh.—Canje Creek, Berbice.
- Hilipus pardalis* Pase.—Rockstone, Essequibo R.
- H. discoides* Fabr.—Issororo, N.W.D.
- H. elegans* Guér., var.—Issororo, N.W.D.
- H. ocellatus* Fabr., var.—Botanic Gardens, Georgetown.
- H. apiatus* Oliv.—Issororo, N.W.D.
- H. elegans* Guér., var. *poecilus*.—Issororo, N.W.D.
- Brachyomus octotuberculatus* Fabr.—Rockstone, Essequibo R.
- Ileomus mucoreus* Linn.—Rockstone, Essequibo R.
- Orthognathus lividus* Gyll.—Paraweka Ck., Essequibo R.
- Cratosomus bianulatus* Champ.—Paraweka Ck., Essequibo R.
- C. hoplites* Perty.—Paraweka Ck., Essequibo R.
- C. bos* Gyll.—Morawhamma, N.W.D.
- Piazurus compactus* Gyll.—Konawaruk, Potaro R.
- P. phlesus* Fabr.—Konawaruk, Potaro R.
- Centrinus cemas* Boh.—Courantyne coast.
- Hypoptus macularis* Champ.—Issororo, N.W.D.
- Eubulus orthomasticus* Germ.—Borbice River.

BRENTHIDAE.

Brenthus anchorago Linn.—Widely distributed and occurs commonly.

- B. bidentatus* Fabr.—Issororo, N.W.D.
- B. calcar* Fabr.—Issororo, N.W.D.
- Belorrhynchus curvidens* Fabr.—Occurs rarely.
- Arrhenodes gnatho* Licht. — Demerara R. and Tumatumari, Potaro R.
- A. angusticollis* Gyll.—Upper Mazaruni R.

ANTHRIBIDAE.

Etychoderes virgatus Fähr.—Canje Creek, Berbice.

P. viridanus Boh.—Puruni R.

P. callosus Jek.—Mazaruni R.

CERAMBYCIDAE.

Macrodonia cervicornis Linn.—This powerful beetle is of fairly common occurrence. It is known locally as the "Sawyer Beetle," owing to its observed habit of clasping a young growing twig of about 1 inch in diameter with its mandibles, and then, still retaining its grip, gyrating swiftly round and round till the twig is severed. The noise thus produced is characteristic and easily recognised again when once heard. Its object in this performance is obscure. The larva has been successfully reared within the decaying trunk of a coconut palm. Occurs both on the coastlands and also in the interior.

Mallodon spinibarbe Linn.—A rare species. Liberty Island, Essequibo R., and Onderneeming, Essequibo.

Chlorida festiva Linn.—Of common occurrence. At times injures the bark of *Hevea* rubber trees.

Orthomegas cinnamoneus Linn.—Widely distributed. The larvae on one occasion were found boring into the dead and dry stem of a *Hevea* rubber tree.

Callichroma suturale Fabr.—Paraweka Ck., Essequibo R.

C. vittatum Fabr.—Onderneeming, Essequibo coast.

Trachyderes succinctus Linn.—Occurs all over the Colony. The adults may frequently be seen during the daytime feeding on the sweet, sticky secretion of the flowering heads of Para grass. This beetle takes readily to flight and is as active in the daytime as at night.

T. melas Boh.—Paraweka Ck., Essequibo R.

Eburodacrys sulphureosignata Er.—A widely distributed forest species. Attracted to artificial lights.

Pyromorphus centrolineatus Bates.—Occurs frequently within the forest area.

Colobothea annulata Fabr.—Rockstone, Essequibo R., and Demerara R.

C. porcila Germ.—Essequibo coast.

C. bisignata Bates.—Paraweka Ck., Essequibo R.

Achryson surinamum Linn.—Issororo, N.W.D.

Ozodes nodicollis Serv.—Rockstone, Essequibo R.

Neoclytus rufus Oliv.—Data missing.

Enoplocerus armillatus Linn.—Paraweka Ck., Essequibo R.

Glyptoscapus cicatricosus Auriv.—Rockstone, Essequibo R.

Periboeum pubescens Oliv.—Christianburg, Demerara R.

Ibidion maronicum Thoms.—Rockstone, Essequibo R.

Onmata notabilis White.—Bartica, Essequibo R.

Megaderus stigma Linn.—Paraweka Ck., Essequibo R., and Christianburg, Demerara R.

Hammaticherus plicatus Oliv.—Botanic Gardens, Georgetown.

H. batus Linn.—Christianburg, Demerara R.

Cyllene cayennensis L. & G.—Canje Creek, Berbice. Adults taken on "Blood-wood" tree.

Mecometopus wallacei White.—Rockstone, Essequibo R.

M. lactus Fabr., var.—Issororo, N.W.D. (*C. B. Williams*).

Listroptera tenebricosa Oliv.—Bartica, Essequibo R.

Chrysoprasis aureicollis White.—Demerara R.

Pantonyssus nigriceps Bates.—Tumetumari, Potaro R.

Oxymerus luteus Voet.—Issororo, N.W.D.

Steirastoma depressum Linn.—Found throughout the Colony. It cannot be regarded as a dangerous pest of cacao here as in Trinidad.

S. melanogenys White.—Rockstone, Essequibo R.

Taeniotes subocellatus Oliv.—Paraweka Ck., Essequibo R.

Oreodera glauca F.—Paraweka Ck., Essequibo R.

O. verrucosa Bates.—Christianburg, Demerara R.

Acanthoderes daviesi Swed.—Paraweka Ck., Essequibo R.

A. lateralis Bates.—Rockstone, Essequibo R.

Amphionycha megalopoides Bates.—Issororo, N.W.D.

Oncideres repandator Fabr.—A pest of mango trees. Onderneeming, Essequibo coast.

O. albomarginata Th.—Recorded as destroying the bark of a Kolanut tree. Issororo, N.W.D.

Onychocerus scorpio F.—Rockstone, Essequibo R.

Nyssodrys deleta Bates.—Issororo, N.W.D.

Oedopeza pogonocheroides Serv.—Essequibo and Mazaruni Rivers.

Polygraphis horrida F.—Rockstone, Essequibo R.

Acrocinus longimanus L.—Known as the "Harlequin Beetle." Rarely met with. Paraweka Ck., Essequibo R.

A. trochlearis L.—Georgetown.

BRUCHIDAE.

*Caryoborus nucleorum** F.—A common species of Bruchid which attacks exclusively the seeds of various species of palms. The following species of palms are known to be thus attacked:

Bactris major, Elais guineensis (West African Oil Palm).

The characteristic damage performed by these beetles has been observed in the seeds of the Cokerite palm (*Maximiliana regia*). The habits of this insect were exposed by some unsuccessful attempts to germinate a number of seeds of the West African Oil Palm grown in British Guiana. Almost every seed was found to be infested by the larva of this beetle. The seeds while on the palm have a fleshy covering which is usually gnawed off by fruit-eating bats. The seeds eventually fall to the ground and there become infested by the Bruchid, probably in the following manner. The adult female beetle deposits its egg within the micropyle of the seed. On emergence the young larva makes its way down through the micropyle to the kernel, where it remains and feeds till mature. The perfect insect emerges through a perfectly circular hole which it neatly bores through the extremely hard shell. Apparently perfect seeds on being broken open are frequently found to be infested by a full-grown larva which fully occupies the interior of the seed. It could only have obtained entry when freshly hatched from the egg by transversing the micropyle as described above. Fully 80 per cent. of the seeds are often found thus attacked. By removing the seeds before they fall to the ground such attack may be successfully avoided.

Spermophagus semifasciatus Boh.—This species of Bruchid was brought into British Guiana with a large shipment of beans. Fully 50 per cent. of the beans were infested. The destruction of the entire shipment was undertaken in consequence.

CHRYSMELIDAE.

MEGALOPODINAE.

Mastostethus curvatus Fabr.—Tumatumari, Potaro R.

CLYTRINAE.

Ischiopachys bicolor Oliv.—Essequibo and Berbice Rivers.

CHLAMYDINAE.

Chlamys litigiosa Lac.—Tumatumari, Potaro R.

EUMOLPINAE.

Myochrous armatus Baly.—This small beetle damages the immature foliage of sugar-cane when the leaves are tightly rolled up and form the centre shoot. The insect gnaws into the shoot, never biting it completely through. When the leaf becomes fully expanded, wherever this beetle has been at work, a row of circular, equidistant holes appear right across the leaf-blade. These pests are exceedingly numerous on all sugar estates.

Colaspis hypochlora Lef.—This species is occasionally troublesome to the foliage of rose trees.

C. fustidiosa Lef.—Berbice.

C. floricornis Fabr.—Feeds on wild Solanaceous plants. Fairly common.

C. trivialis Boh.—Onderneeming, Essequibo coast.

C. aeruginosa Germ.—A common and widely distributed species.

Biorus clytroides Lef.—Agatash, Essequibo R.

Eumolpus surinamensis Fabr.—This handsome species is occasionally met with in the interior districts. Sometimes found in small colonies.

Prionodera bicolor Oliv.—Tumatumari, Potaro R.

Metaxyonycha testacea Fabr.—Tumatumari, Potaro R.

Chalcophana viridipennis Germ.—Mazaruni R. (W. D. Cleary, 1918).

Rhabdopterus limbalis Lef.—Damaging young cacao leaves. Essequibo River. 19.viii.18.

CHRYSOMELINAE.

Doryphora arenata Oliv.—Rockstone, Essequibo R.

D. maculata Oliv.—Rockstone, Essequibo R.

D. annulata Er.—Upper Mazaruni R.

<i>D. aestuans</i> Linn.	}	Additions to list made by Dr. G. A. K. Marshall. No specimens exist in this collection.
<i>D. comica</i> Stål.		
<i>D. obscuripennis</i> Stål.		
<i>D. quadripustulata</i> Panz.		
<i>D. rubropunctata</i> DeG.		
<i>D. vittata</i> Fabr.		

HALTICINAE.

Epitrix pilosa Jae.—Invariably associated with the foliage of the egg plant (*Solanum melongena*). It bites out innumerable small holes especially in the younger leaves. Causes serious damage. Common on coastlands.

Haltica jamaicensis Fabr.—Issororo, N.W.D.

GALERUCINAE.

Coelomera cayennensis Fabr.—One of the commonest species of beetles in the Colony. The larva feeds on the foliage of the “trumpet tree” (*Cecropia peltata*).

C. bajula Oliv.—West coast, Demerara.

Dircema cinctipennis Clk.—Rockstone, Essequibo R.

D. nigripenne Fabr.—Tumatumari, Potaro R.

HISPIDAE.

Chalepus sanguinicollis Linn., var.—Suddie, Essequibo.

CASSIDIDAE.

Omoplata flava Linn.—A common species; apparently confined to coastlands.

O. marginata Linn.—An uncommon species. Coastlands.

Mesomphalia bipustulata L. (*discors* F.).—Occurs all over British Guiana. A common species.

M. discoides Linn.—A rare species. Konawaruk R., Potaro.

M. inaequalis Linn.—Rockstone, Essequibo R.

M. brachiata Fabr.—Bel Air, Demerara.

M. flavomaculata Fabr.—Issororo, N.W.D.

M. lateralis Linn.—Issororo, N.W.D.

Coptocycla sexpunctata Fabr.—This small insect when alive appears as a small, rounded fragment of finely burnished gold. When dead its brillianee vanishes completely. Occurs commonly.

C. judaica Fabr.—Botanic Gardens, Georgetown.

Dolichotoma variegata Linn.—Skeldon, Courantyne R.

Chelymorpha cribaria Fabr.—Skeldon, Courantyne R.

C. cingulata Boh.—Issororo, N.W.D.

C. clivosa Boh.—Bel Air, Demerara.

C. brunnea Fabr.—Issororo, N.W.D.

Ctenochira quadrata DeG.—Issororo, N.W.D.

Selenis spinifex Linn.—Issororo, N.W.D.

Cassida tristriata Fabr.—Skeldon, Berbice.

Tauroma bicornis Linn.—Tumatumari, Potaro R. A rare species.

TWO SPECIES OF BRITISH APHIDES.

BY F. LAING, M.A., B.Sc.

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Macrosiphoniella asteris (Walk.).

Aphis asteris Walker, Ann. & Mag. Nat. Hist. (2) iii, 1849, p. 48.

Apterous Viviparous Female. Olive-green, shining, under surface pulverulent, oval, domed. Antennae equal in length to the insect itself, black, except for the proximal third of segment iii, which is pale brown. Segments i, ii equal,

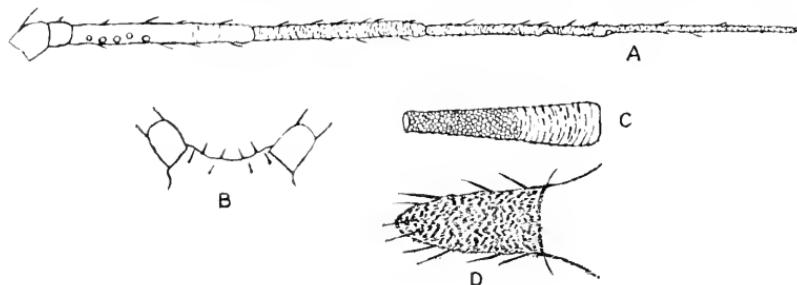


Fig. 1. — *Macrosiphoniella asteris* (Walk.). Apterous ♀: A, Antenna; B, Front of head; C, Cornicle; D, Cauda.

iii slightly longer than iv, v shorter than iv, vi nearly twice the length of v, the spur being four times the base; a few hairs on all the segments, imbrications faint on distal end of iii, and whole of iv, distinct on v and vi;

proportions 5, 5, 28, 26, 20, 39 (8+31). Primary sensoria on v and vi, 4-5 secondary sensoria on basal one-third of iii. Antennal tubercles very moderate. Head brown, eyes pink. Rostrum reaches to the third pair of coxae, greenish, dark at tip. Pro- and metathorax rather darker than the prevailing colour. Legs pale brown with coxae, tips of femora and of the tibiae, tarsi and claws black. Lengths: femora of i 0·64 mm., iii 0·8 mm.; tibiae i 0·92 mm., iii 1·32 mm.; tarsi i 0·16 mm., iii 0·14 mm. Abdomen domed, shining, olive-green, with black tufts arranged more or less regularly in rows; these in balsam preparations generally show a spine in the middle. Semilunar black mark at base of each cornicle. Towards the margins a slightly browner shade. Cornicles black, wider at the base than at tip, flanged, reticulated on apical half. 3 mm. long. Cauda coloured as in abdomen, equal in length to the cornicles, 3-4 marginal hairs, 2-3 median-apically. Anal plate black.

Total length 2·5 mm.

Apterous females only; colour notes from living specimens.

Shoeburyness, Essex, 31.viii.1919 (K. G. Blair) on *Aster tripolium* (nec *A. trifolium* of Wilson and Vickery's list).

This species has not been recorded since Walker described it. His material seems to have been lost, but his colour description agrees with the species here redescribed. It is a typical *Macrosiphoniella*, and is allied to both *M. artemisiae* (Boyer) and *M. millefolii* (Fabr.), but readily distinguishable from both. This brings the number of species belonging to this genus up to twelve. Del Guercio (Redia, vii, 1911, pp. 331-333) includes *Siphonophora lutea* Buckt. in *Macrosiphoniella*, but judging from the slide in the Buckton Collection the species should be placed in *Macrosiphum* Pass.

Aphis tripolii, sp. n.

Apterous Viviparous Female. Ovate, vivid green, with irregular darker green on abdomen. *Antennae* with segments i-iii very pale green, iv-vi darker green, half the length of the insect, segments i and ii equal, iii a little shorter than vi, iv a little longer than v, spur of vi twice the length of the base; proportions 3, 3, 10, 7, 6 (4+8), length 8 mm. Head green, eyes red, thoracic segments green, strong lateral tubercle on prothorax. Rostrum reaching to the third pair of coxae. Legs very pale yellow, distal end of tibiae black, tarsi black. Lengths: femora of i 48 mm., iii 72 mm.; tibiae of i 80 mm., iii 1·20 mm.; tarsi of i 20 mm., of iii 20 mm. Abdomen with five marginal papillae on segments 1-4, and 7. Cornicles dark brown, imbricated, slightly longer than the cauda, 0·2 mm. long. Cauda dark brown, a little shorter than the cornicles, four marginal hairs.

Length 1·6 mm.

Alate Viviparous Female. Head, thorax, black, abdomen green. *Antennae* black, about two-thirds the length of the insect, segments i, ii equal, iii considerably shorter than vi, iv and v equal, spur of vi more than twice

the length of the base, iii imbricated, with 9–11 secondary sensoria, arranged along its whole length, iv with three sensoria, v with sometimes one sensorium half-way along. Proportions 15, 15, 65, 50, 50 (23+54), total length 1 mm. Head with one median and two lateral ocelli. *Rostrum* reaching the hind coxae. *Prothorax* with a strong lateral spine. *Abdomen* with five pairs of

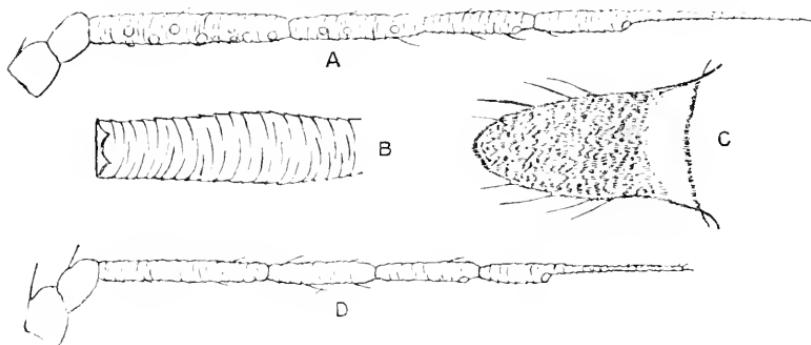


Fig. 2.—*Aphis tripolii*, sp. n. Alate ♀: A, Antenna; B, Cornicle; C, Cauda; D, Antenna of apterous ♀.

marginal papillae on segments 1–4, and 7. *Cornicles* dark brown, imbricated, a little longer than the cauda, and slightly broader at the base than the apex, ·18 mm. long. *Cauda* dark brown, with four marginal hairs, ·16 mm. long. Fore legs pale brown, middle and hind pairs pale brown, with the tips of the femora, tibiae, and tarsi black. Length: femora i ·28 mm., iii ·5 mm.; tibiae i ·54 mm., iii ·80 mm.; tarsi i ·10 mm., iii ·10 mm.

Length 1·5 mm.

Shoebury Ness, Essex, 31.viii.1919 (K. G. Blair) on *Aster triplinum*. Co-types in the Brit. Mus.

British Museum (Nat. Hist.), S.W. 7.

November 1919.

A NEW SYCOPHAGINE (AGAONIDAE-CHALCIDOIDEA) GENUS AND SPECIES FROM THE GOLD COAST.

BY JAMES WATERSTON, B.D., B.Sc.

The position of the remarkable form described below may be seen from the following tables:—

AGAONIDAE.

♀ ♀.

- Mandibles with leaf-like striae or minutely denticulate appendage; articulated * palpi absent AGAONINAE.
- Mandibles without appendage; articulated palpi present SYCOPHAGINAE.

* In *Ceratosolen* there is sometimes on the 1st maxilla at the side a rod-like setigerous process of doubtful homology.

SYCOPHAGINAE.

♀ ♀.

Maxillary palpus with 1, labial 2, antenna with 13 joints.

..... *SYCOPHAGA* Westw. (1840).

Maxillary palpus 2, labial 1, antenna 11-jointed. No joint in the funicle unusually broad..... *CROSSOGASTER* Mayr (1885).

Maxillary palpus 3, labial 2, antenna 11-jointed. Funicle medianly broadened and tapered both towards the club and the ring-joint; second joint widest.

..... *SERES*, gen. nov.

Maxillary palpus 4, labial 2, antenna 11-jointed. First funicular joint much wider than the others *SYCOECUS* Waterst. (1914).

NOTE.—*Platyscapus* Motsch., which is presumed to be a Sycophagine, should be separable from any of the above by the 9-jointed antennae.

In the *Sycophaginae* there is evidently a considerable variation in the palpal joint formulae which is noteworthy in view of the uniformity prevailing through long series of genera in other families of the Chalcidoidea. This variability, however, does not necessarily imply a distant relationship between the genera listed above. The peculiar life-conditions of these tiny wasps makes it probable, indeed, that groups exhibiting differences in structure quantitatively great are phylogenetically closely connected. The many striking structural modifications of the *Agaonidae* are largely for biting, digging, rasping, and clearing away of vegetable tissue, and in such changes, affecting as they do the mandibles and head, the trophi are liable to be involved. In the Agaonine series, at least, the absence of palpi and the presence of the mandibular appendage are plainly correlated. It is interesting to note by what varied means the same result is achieved in this family. In *Blastophaga*, *Agaon*, etc., the rasping lamina is fixed anteriorly to the base of the mandible. In *Sycoecus* the rasp is the modified fore tibial spur, which is carried forward below the head by the elongate coxa and femur to rest in approximately the position occupied by the mandibular appendage in the other genera. In *Seres* the tibia itself has become a stout rasp and scoop combined, carried forward as in *Sycoecus* by the elongate coxa and femur.

SERES, gen. nov.

Head very elongate; eyes moderately large, mouth-edge with two somewhat angular lateral lobes between which is the broadly truncated projecting clypeus. Toruli midway between ocelli and clypeal edge. Facial impression long and narrow. Antennae 11-jointed; scape, pedicel, two ring joints, four funicular, and three in club. Funicle and club compressed. Mandibles robust, the right three or four, the left three dentate; one or more of the teeth in each long, stout, and falcate; base of the mandible with strong curved process extending into the head for muscular attachments. Maxillary palpus 3-jointed, the labial

2-jointed. Pronotum porrect, a little shorter than the entire mesonotum, the two together barely longer than the head. Propodeal spiracles circular. Wings post-marginal, shorter than the radius, and both much exceeded by the marginal. Discal ciliation sparse and obsolescent. Fore legs much modified; the coxae elongate. Femur oblong, stout. Tibia short, bent, armed dorsally with sharp peg-like spines. Tarsus normal, slender, as are also the mid and hind legs. In all the tarsi the joints, except the 5th, bear a pair of spinose bristles, preapical and ventral in position. Abdomen compressed, tergites deeply incised posteriorly. Segments 4 and 5 longest. Spiracles very broadly oval. Ovipositor rather stout, short, decurved. Sternites 1-2 medianly incised posteriorly, while 3-5 are produced; the 5th is in profile ploughshare-shaped and longer than the rest taken together.

Genotype the following species:—

Seres armipes, sp. n.

A blackish-brown species in which the ground-colour is completely masked by brilliant blue-green metallic reflections, which are strongest anteriorly, particularly on the head. Abdomen duller. Mandibles dark castaneous. Trophi pale. Antennae castaneous; coxae and femora mainly blackish brown. Tibiae and tarsi paler. Wings clear, glossy, almost invisible in balsam; veins very faintly embrowned.

Head: length (depth) .87 mm.; across the vertex the breadth is $\frac{1}{2}$ and at the mouth-edge $\frac{1}{3}$ of the length. Eyes $\frac{1}{3}$ as long as the head and separated by $\frac{3}{4}$ of the breadth across the frons. Toruli distinctly below the base-line of the eyes; small, circular, contiguous. Ocellar triangle a little more than right angled anteriorly. Integument strongly chitinised, smooth, polished. Frontal surface generally bare, but there are a few bristles (minute) along the orbits and one or two above each of the lateral clypeal lobes. Antennae .75 mm. long. Scape slender (7:1), parallel-sided, with about a dozen short bristles along the dorsal edge, and the same number on the inner aspect with about 8 very minute ventrally. Pedicel (3:1) not quite half as long as the scape, with about a dozen bristles mainly on the inner surface. Ring-joints stout, each with one dorsal and one ventral bristle. The normal funicular joints and the club segments are in the ratio 12, 13, 13, 14, 15, 11, 11; in the same scale the respective breadths of the funicular joints are 17, 22, 20, 17, while the club is 16 at the first suture. Sensoria numerous, long, and stout: 1st funicular with about 12, the 2nd 18, 3rd, 4th, and first two club segments about 14, while the last segment has 8. There is a minute cone-shaped terminal sense-organ armed with a short apical bristle and others more minute. Trophi: cardo narrow, L-shaped; stipes bare; maxillary palpus 8:5:7, with its greatest breadth (2) at the apex of the 1st joint, all the joints with one moderately long preapical bristle, the third with, in addition, a short terminal bristle $\frac{1}{3}$ the length of the joint itself. Labial palpus (11:11), the first joint bare, the second with 2 short preapical bristles and another $\frac{1}{2}$ as long as the supporting joint. Thorax + Propodeon 1.2 mm. Pronotum in the form of a truncated isosceles triangle $\frac{1}{3}$ longer than broad and $\frac{1}{2}$ the length of the combined scutum and scutellum. Spiracle slightly prominent, with one stout bristle in front and a number of minute ones scattered irregularly, chiefly anterolaterally. Parapsidal furrows ending just inside the axillary sutures.

Mid lobe with a group of small bristles on each side before $\frac{1}{2}$ just inside the furrows. Axillae narrow, with 2-3 minute bristles and 1 longer and stouter at the posterior angle. On the scutellum at the posterior edge are two strong bristles set wide apart. Propodeon, spiracles set near the side at $\frac{1}{2}$, with a few minute bristles behind. There are 3-4 stout stiff bristles on the upper edge of the metapleureon and a few (minute) below. Fore wings about $2\frac{3}{4}$ as long as broad; length 1.7 mm., breadth .6 mm. Submarginal : marginal : radius : postmarginal in ratio 48 : 18 : 11 : 9. On submarginal 8-9 bristles; on marginal + postmarginal at the edge 11-12, and on these veins themselves are 9 in all. Radius bare, with 1 bristle at base. Basal third of wing practically bare, but distally and arranged mainly parallel with the long axis of the wing are about a dozen irregular hair-lines; the cilia short, weak, and wide apart.; Marginal fringe short and sparse. Hind wings 4 times as long as broad; length 1.3 mm., breadth .3 mm. The neuration .8 mm. in length. The submarginal cell distally extremely narrow, extending linearly nearly to the hooks. At the base of the submarginella where it lies along the costa are 6-7 bristles, 2 at the upturn, and 6-8 towards the hooks. Behind the neuration and extending to the tip of the wing is a sparsely set row of weak cilia.

Fore legs: coxa (3 : 1) about $\frac{2}{3}$ the length of the femur (3 : 1), which is of nearly equal breadth throughout. Tibia about $\frac{1}{3}$ of the femur in length, with about 20 spines, 10 extremely stout and peg-like along the apical edge and about 8 similar behind and 2-3 much weaker near the base. Tarsus 36 : 18 : 12 : 10 : 33. Mid legs slender. Femur $\frac{2}{3}$ of the tibia in length, spur of the latter definitely preapical. Sutures of tarsus very oblique. Tarsus in ratio 95 : 60 : 40 : 27 : 40. Hind legs: tibia without definite apical comb. 2nd spur short, stout, peg-like, only $\frac{1}{2}$ of the 1st. Two similar small spines among the stout bristles at the upper apical angle. Tarsus in ratio 75 : 60 : 40 : 27 : 50.

Abdomen: tergites 1-2 subequal, the second being slightly shorter; the third is about $\frac{1}{2}$ longer and equal to the 6th but just shorter than the 5th; the 4th is half as long again as the 1st. Stylet short (not as long as the basal breadth of the valve of the ovipositor), with 2 subapical and 2 apical bristles of which the longest is nearly twice the process itself. Tergites 1-4 have posteriorly 3 median slit-like incisions (the central slit on tergite 1 being carried in to $\frac{1}{2}$ the length of the sclerite), with 1-3 others indistinctly marked on each of the overlaps. On 5 and 6 respectively there is 1 short median slit. On tergite 6 there are about 8 strong bristles between, and 3-4 minute around, the spiracles anteriorly with 3-4 behind. 2 stout bristles (1 : 1) between the stylets. On the sheath of the ovipositor are 2-3 rows of short bristles increasing in length distally.

Length about $4\frac{1}{4}$ mm., of which the ovipositor occupies .7 mm.; alar expanse $3\frac{3}{4}$ mm.

Hab. GOLD COAST, Accra, in lab. vi.1919 (*J. W. S. Macfie coll.*).

Type, ♀ in Brit. Mus. Communicated through the kindness of Prof. Newstead, F.R.S.

Imperial Bureau of Entomology, London.

November, 1919.

Insects damaging lead.—For a good many years the Natural History Museum has been receiving from various parts of the globe pieces of lead damaged by insects, and as doubt has frequently been expressed as to such a thing being possible, the following information is given either from previously published records or else from our own files. In the "Electrical Review," December 8th, 1911, the Chief Engineer of the Australian Federation Telegraphs states how the lead sheathing of the telephone cables in Adekhade had been eaten away in places for several inches by Termites, and how several years previously Termites had eaten through the bitumen compound covering the Sydney Tramway cables and attacked the lead sheathing, finally eating into the insulation of the high-tension cables, thus causing frequent breakdowns and enormous expense, as miles of cable were affected. Damage of a similar nature has been reported from Buenos Ayres and Hongkong. In "Insect Life," iv, 1891, pp. 81 and 202, Riley and Howard relate how a Cossid larva bored its way through a large lead bullet, which had become embedded in an oak-tree in which the larva was living, and how the larvae of *Mono-hammus confusor* Kirby, bored through a lead pipe $2\frac{1}{2}$ inches thick, while they quote another instance from "Gesundheit's Ingenieur," January 15, 1891, of a "wood-wasp" also cutting through a lead pipe. The earliest published record of an insect damaging lead which we have been able to find is that contained in Kirby and Spence, Entomology, ed. 7, 1856, p. 120, note (3), where these authors state that the larva of *Callidium [Hylotrupes] bajulum* L., made its way through sheets of lead one-sixth of an inch in thickness. In May of this year we had specimens of *Tetropium gabrieli* Weise sent us by Prof. A. Denmy, Sheffield University, who stated that these beetles had been guilty of perforating the lead lining of wooden vats. Mitsuhashi in his work on the Japanese Buprestidae ("Byochugai Zasshi," vi, no. 4, 1919), on the authority of Prof. Sasaki, has recorded *Buprestis japonensis* Saund. injuring lead-piping. In Bull. 10 (n. s.), U.S. Dept. Agr. Bur. Ent. 1898, p. 88, Howard states how a species of *Lyctus* bored through the lead lining of a water tank and thereby nearly caused a law suit, while for a good many years there has been on exhibit in the Museum a piece of lead riddled by the borings of an *Anobium*. In the early part of March of this year we received from Major Gambier-Parry, of Highnam Court, Gloucester, a good many specimens of *Ptinus sexpunctatus* Pz., together with some pupae of *Osmia rufa* L. Our correspondent related how the lead on the roof of the billiard-room had been punctured by some insect, and wherever the holes were in the lead the *Ptinus* was found. We were unsuccessful in obtaining any of the damaged lead. This case has been dealt with already (see Morley, *ante*, p. 107), but we see no reason why Morley should credit the damage to *Osmia rufa*. In the Bull. Ent. Research, vi, 1915, p. 201, it is recorded how Lounsbury found *Sinoxylon ruficorne* Thr. boring in the lead-covered aerial cables in S. Africa, the hole being bored at a point in the cable sheath immediately underneath the marline suspender by which the cable is attached to the suspending wire. Similar damage has been done in Queensland by *Bostrychopsis jesuita* F. and *Xylopertha* sp., while Froggatt (Agr. Journ. N. S. Wales, 28, no. 11, 1917) records *Nylothrips gibbicollis* doing almost identical damage, two beetles being actually found *in situ*. Lesne [Ann. Soc. Ent. France, Ixix, 1900 (1901), p. 591 (note)] quotes another Bostrychid, *Scobicia pustulata*, as boring in a gas-pipe in Europe. The only

record of a Hymenopteron boring lead known to us is that of Vaysière (Bull. Soc. Ent. France, no. 17, 8th Nov. 1916, pp. 273-274). He states how the larvae of *Sirex gigas* L. had been living in the wood underneath the lead covering of the lead tanks of a lead chamber process in a chemical factory in the South of France, and the imagines on emerging, finding the lead sheet between them and liberty, bored through it.—F. LAING, British Museum (Nat. Hist.), Cromwell Road, S.W. 7: November 10th, 1919.

New Bark-beetles from Vladivostok: a correction.—This paper (*ante*, pp. 246-251, pls. xv, xvi) was written in Russia in 1917, and accepted in 1919 by the Editors of the "Entomologists' Monthly Magazine" before I, as a refugee, had an opportunity of examining in Sweden the Epidemiological literature of 1918 and 1919. An inspection of the latter shows that my subgenus *Hylastinoides* is synonymous with *Abniphagus* Swaine (J. M. Swaine, "Canadian Bark-beetles," Part ii, Bulletin 14, Ottawa, 1918, pp. 43, 73).—D. PAUL SPESSEVITSEV, c/o Dr. Ivar Trägårdh, Entomologiska Laboratoriet, Experimentalvälfältet, Stockholm.: October 19th, 1919.

*A note on the Melyrid-genus *Heteracrius* Kirsch.*—During a recent attempt to name the British Museum material belonging to the genus *Arthrobrachus* Solier (1849), I have had occasion to study the description of *Heteracrius* Kirsch (1865), and find that it agrees with the second section (*b*) of *Astylus*, as defined in my "Notes on various species of the American genus *Astylus*" (Ann. & Mag. Nat. Hist. ser. 9, ii, p. 340, Oct. 1st, 1918), and it is also obviously synonymous with *Spinoastylus* Pic (Mélanges exot.-entom. xxxi, p. 21, Oct. 8th, 1919 *). *Heteracrius* was treated by Kirsch as a subgenus of the Chilean and Argentine genus *Arthrobrachus*, and this error has not been suspected by subsequent writers; he included in it four species from Bogota, one of which, *H. flavomaculatus* Kirsch = *A. octopustulatus* Gorh. (1886), and the three others, *H. signatus*, *vittatus*, and *decoratus*, are probably synonymous with forms described by Pic or myself, but this could not be satisfactorily settled without comparison of the types. Kirsch gave as the principal characters of *Heteracrius*, "Corpus elongatum, antennae laxius serratae, and elytra sexum diversa." The sexual difference in the form of the apices of the elytra is very remarkable; the spiniform armature, however, is peculiar to the ♀, and not to the ♂ as stated by the German author. His generic name could be retained for the Tropical American forms possessing this structure, and a new specific name would not then be required for *A. vittatus* Gorh. (1882), which is a true *Astylus*. Nine species belonging to it were enumerated by myself (*l. c.*), all from Colombia, Venezuela, or the Lesser Antilles, and various others from the same regions have just been named by Pic (*l. c.* pp. 21, 22). Gorham correctly identified the sexes of his *A. octopustulatus*, the elytral armature being characteristic of the ♂ in all other Malacodermata known to me. The ♂ metasternal tubercles were not observed by Kirsch.—G. C. CHAMPION, Horsell, Woking: October 31st, 1919.

* This paper was issued a week later than one by myself on the African and Asiatic species of the Malacoderm genus *Melyrus* Fab. (= *Zygia* F.) (Ann. & Mag. Nat. Hist. ser. 9, iv, pp. 157-219 October 1st, 1919).

Chaetocnema sahlbergi Gyll. in Sussex.—On May 17th last I took six specimens of this rare species at roots of *Juncus* growing just above high-water mark on the bank of one of the creeks, about three miles from Chichester, and on subsequent occasions during July, August, and September it was met with somewhat freely by sweeping in the evening in the same locality. I was unable to locate the food-plants, but the species was certainly most frequently swept from grass among which *Glaux maritima* was growing. *Crepidodera impressa* F. occurred in profusion on *Statice limonium* in the same locality.—P. HARWOOD, 69 Lyndhurst Road, Chichester: November 1919.

Surothrus areolatus Htg. bred.—When breeding *Phorbia lactucae* I have, on several occasions in recent years, both at Sudbury and Colchester, reared a Cynipid parasite which Mr. L. A. Box has kindly identified as the above species. The parent Cynipids frequent the flower-heads of lettuce in June and July, and the flies and their parasites remain in the puparium throughout the winter, emerging in June of the following year. Some of the puparia are considerably below the average size, but I am not at present aware if it is from these small examples that the parasites emerge. The species is described by Cameron in "British Phytophagous Hymenoptera," iii, 1890, pp. 168-9, and figured on pl. viii, fig. 8 of the same vol. He regards it as "apparently rare," and his only locality is Norwich (Bridgman); he also states that the life-history of the genus is unknown. That it should prove to be an Anthomyiid parasite is not surprising, as a near relative, *Figitis anthomyiarum* Bouché, is recorded from allied species, and it will probably be found to be not uncommon wherever lettuce is allowed to seed. My specimens were all bred from "cabbage-lettuce" sown in the autumn.—B. S. HARWOOD, Melford Road, Sudbury, Suffolk: November 7th, 1919.

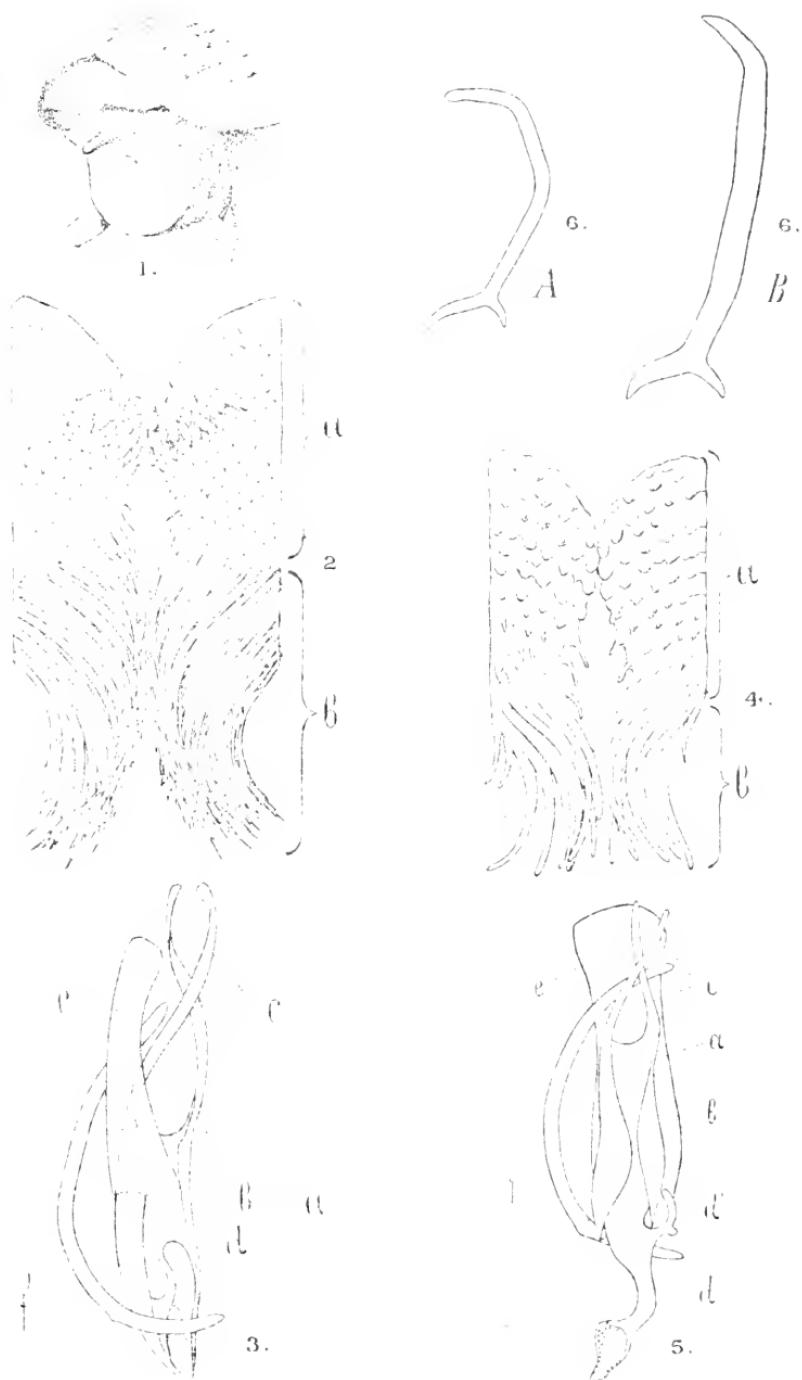
Society.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY : September 11th, 1919.—Mr. STANLEY EDWARDS, F.L.S., President, in the Chair.

Mr. Hy. J. Turner exhibited *Colias edusa* ab. *helicina* (clear lemon coloured) from Cyprus, and three bred specimens of the very local Noctuid *Glottula encaustas* from Catania, Sicily, with notes.

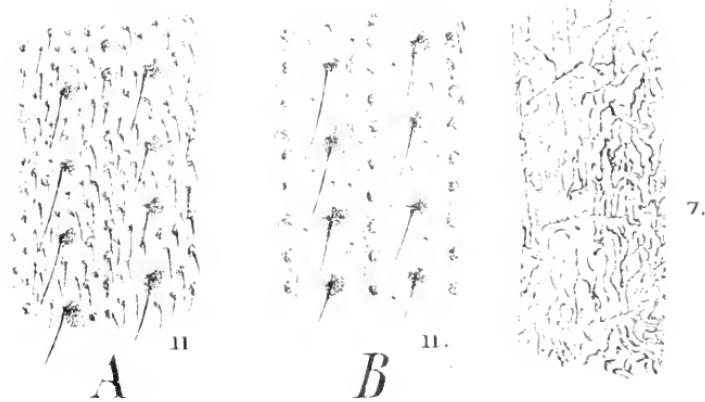
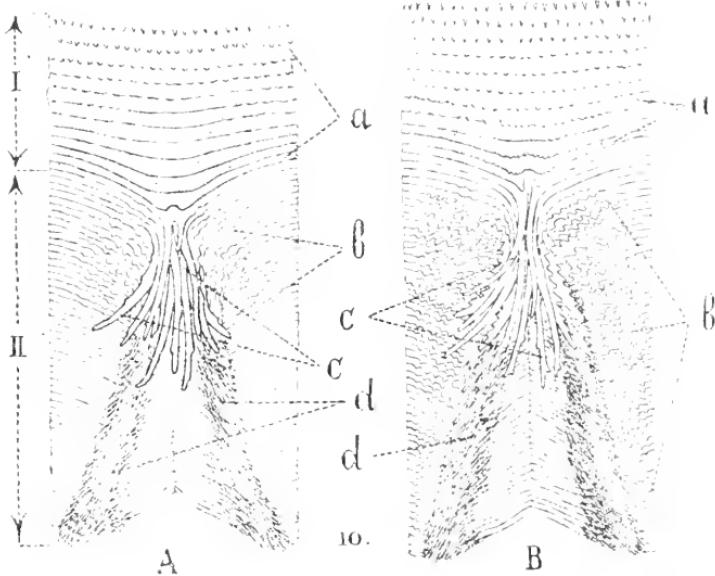
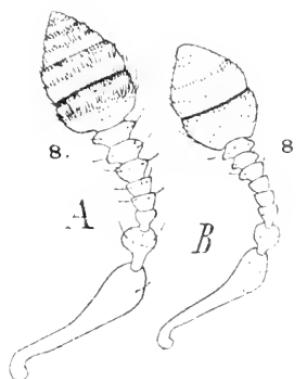
September 25th, 1919.—The President in the Chair.

Lantern-slides were exhibited by Messrs. Lucas, Bennett, and Dennis. Mr. Step, for Mr. Miles, an Atlas Moth, 11 inches in expanse, from India. Mr. Turner, *Hesperiidae* from Cordoba, Argentine, including *Hesperia americana*. Mr. B. S. Williams, a melanic series of *Boarmia repandata* from Finchley. Dr. Chapman, some galls on dogwood.—HY. J. TURNER, Hon. Editor of *Proceedings*.



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